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CULTURAL ADJUSTMENT[1]

By JOHN GILLIN

THE present paper is an effort to set forth in relatively simple and general terms certain suggestions for the analysis of cultural systems within themselves. These suggestions cannot properly be considered to have achieved at the present time the status of established principles, nor can the lines of integration herewith attempted be considered a substitute for a formal system.

It will doubtless be recognized that many of the notions used in the present argument are not in themselves original with the author. Perhaps the original sources of many borrowed concepts are sufficiently familiar to the readers of a technical journal to require no documentation, but under normal academic conditions the author would have preferred, so far as he was able, to give full and precise credit to the published works of all those scientists who have stimulated the present discussion. Due to the fact that the paper has been written during my absence from the United States under circumstances which preclude access to adequate bibliographic resources, I shall have to try to be content for the present with a grateful but general acknowledgment to all my colleagues interested in similar problems, since citing from memory and from the incomplete references at hand might well prove both inaccurate and unfair.

Pure culture, as distinguished from phenomena and problems involving a cultural factor, has received relatively little scientific attention. This is partly due to the fact that culture is apparently never directly manifested to our senses, but always through the medium of some form of human activity, or results of such activity. It is, therefore, not uncommon to confuse the cultural factor or factors of a phenomenon under study with one or more other types of factors which, if clearly analyzed, turn out to be non-cultural.

Practically all of modern social science, however, recognizes that culture "modifies," or enters into other relations with, a wide variety of phenomena

[1] I wish to record my thanks to Professor Ralph Linton for his help in seeing this paper through the press in my absence from the United States. More important is the acknowledgment I should like to record, even in connection with so insignificant a contribution as the present, of Professor Linton's continued scientific stimulation in word, writing, and deed, of which I have been a beneficiary for a period of about fifteen years.

and in a multiplicity of circumstances. If we accept this view, we may deduce that, analytically (if not phenomenologically) speaking, culture possesses certain independent characteristics of its own, which should conform to discoverable laws or principles. If we could discover such generalities applying to "pure culture," we should have a group of tools to explain many aspects of situations, at present inadequately understood, in which culture plays a significant part. For example, the writer, in suggesting elsewhere[2] an explanation of certain phenomena of the acculturation process, was able to go some distance with the use of certain psychological concepts, but suggested that the full explanation awaited a clearer understanding of how cultural patterns "are adjusted to each other," an understanding which seemingly must be achieved on the purely cultural level. Many noteworthy advances have been made and remain to be made in the social sciences by applying the principles of physiology, heredity, physiography, psychology, etc., to social phenomena, but this does not excuse us from the necessity of attempting to come to grips with principles of culture itself, the presence or influence of which is the one element which distinguishes most human social situations from situations and phenomena of other types. It is, therefore, upon a very preliminary exploration of the "purely cultural level" that we propose to embark.

It is to be understood that all statements made herein, even when couched in didactic form because of limitations of space, are nevertheless to be considered as hypotheses or postulates whose ultimate validity remains to be proven, or rejected. Another point to be borne in mind is that, although we shall attempt something along the lines of part-analysis, this does not signify that we summarily deny the validity, for certain purposes, of configurational or gestalt approaches,[3] or, for that matter, of any other type of approach. Our approach, however, aims to provide a guide for specific studies of cultural adjustment and maladjustment *within* cultural situations and within cultural systems.

We may start out by taking the position that *culture in general is a type of patterning which applies to and is associated without exception with all types of customs*. Customs we consider to be socially learned, socially shared, and socially transmitted human activities, overt and covert. Human activities fall into several other generic classes in addition to that of custom: they may be socially shared, but innate (therefore unlearned), they may be learned, but idiosyncratic (therefore not socially shared), and so on. It is only with actual or potential customary activities that culture, strictly speaking, is concerned. Returning to our definition of culture, then, we shall not dwell upon its impli-

[2] John Gillin, *Acquired Drives in Culture Contact* (AMERICAN ANTHROPOLOGIST, Vol. 44: 1942), pp. 545–554.

[3] John Gillin, *The Configuration Problem in Culture* (American Sociological Review, Vol. 1: 1936).

cations further than to stress that culture is to be regarded as the patterning of activity, not activity itself. *A* culture, as distinguished from culture in general, may be thought of as a specific system of patterns which govern or are supposed to govern a given set of customs. In calling a culture a system we are, of course, merely making the basic assumption of science, namely, that some degree of order and regularity exist in all aspects to the universe and that it is the function of science to uncover them and analyze them.

That pattern and activity are not identical can usually be clearly understood when considering the range of variations in the performance of actional customs. For example, at least one clear and recognized pattern applies to the actional custom of driving a golf ball, yet only one man in a hundred habitually performs the pattern perfectly, although the other ninety-nine are usually striving mightily, and with varying success, to do likewise. It has also noted that pattern is not identical with "behavioral norm" in the sense of a statistical measure of the various individual performances of a group. In golf-ball-driving there are usually two "norms" about which golfers of an unselected sample tend to to cluster—the "hook" norm, and the "slice" norm. In class-room performance, according to our rather inadequate 100-point scales, a score of 100 is supposed to indicate perfect performance of the patterns for the customs being taught, but an unselected sample of students usually tends to cluster about 75, as well as other subsidiary norms.

Empirical observation seems to indicate that three types of customs may be distinguished: Actional, Representational, and Symbolic.

(I. Behavioral customs).
(A) Actional customs
(B) Representational customs
(II. Symbolic customs).
(C) Symbolic customs.

These may also be classified into two categories, as indicated above by parentheses: Behavioral Customs, of which Actional and Representational Customs comprise two sub-classes, and Symbolic Customs. Customs of the Behavioral class are commonly overt or can be made sufficiently so to be examined empirically with comparative ease. Symbolic customs, on the other hand, are "mental" and covert; "thoughts," dreams, and fantasies come under this head; and they are called symbolic customs, because the activity involved is often a "mental" symbolization of behavioral activities, or is commonly understood as such. This is not the place to discuss the psychological nature of symbolic activities, which are by no means yet completely understood by psychologists. From the cultural point of view, however, we note that symbolic activity can be communicated from one individual to another only through the medium of behavioral activities; i.e., on the social level,

symbolic customs are generically dependent upon actional customs or representational customs. For example, one may "think up" a story or a scientific theory and go over it repeatedly (i.e., practice it) "in his mind." This is symbolic activity, but, if it is to become custom (socially shared), one must "express" it in the form of words, diagrams (or other representational customs or their products) and/or actions, examples (or other actional customs, or their products). We might say, then, that representational activity of any kind is successful only in terms of the common experience of shared actional activity of the parties in communication; on the cultural level, representational customs depend for their efficacy upon shared experience with a system of actional customs.

The immediate goal of actional customs is, simply speaking, physical change in the situation; the immediate goal of representational customs is communication between one individual and another. The difference is illustrated by the distinction between threatening your adversary and pummeling him; between actually climbing a mountain and merely saying "we climbed the mountain"; between "talking a good game of golf" and playing it. We should also note that representational customs often form a link, as it were, between actional and symbolic customs: through proper representation a fantasy may be transformed into reality (action), whereas, conversely, through proper ("convincing") representation elements of reality (action) may be woven into fantasy (i.e., detective fiction).

Ethnographic and sociological data show unquestionably that customs of these three types are everywhere present among human social groups. Perhaps no one has to be convinced of the existence of actional and representational customs. We remind those skeptical of the existence of "symbolic customs" (socially learned, shared, and transmitted symbolic activities) of the fact that repeated investigations have shown that members of the same social group tend to exhibit similarity in structure and content of dreams and fantasies. In our own society, the repeated episodes involving inventors who "independently" produce inventions and discoveries at about the same time, would seem to be explained by the fact that they share common symbolic customs, although otherwise not in contact with each other.

If we grant that actional, representational, and symbolic customs are practiced in all social groups, and also that culture is patterning invariably associated with customs, we conclude that actional, representational, and symbolic patterns exist in every culture. Culture patterns may be differentiated, classified and specified according to many other points of view— and we shall point out what we consider to be some of their significant differences later—but it is sufficient at present if we accept the view that a cultural system is a more or less intricate collection of distinguishable and discrete patterns for as many customs. We know that it is through its customs, and the materialistic prod-

ucts of its customs, that a human social group makes the majority of its adaptations to the conditions in which it exists. We have, in this article, assumed that each custom is governed by or associated with a pattern and that the totality of the patterns governing or associated with the customs of a given group constitutes (together with other elements to be later specified) a cultural system.

We may on this basis state informally that the "use" of a cultural system is to provide a guide for the adaptive customary activity of a human social group. Let us call this the *adaptive aspect* of a cultural system. It is obvious that, as is the case with many other types of systems, a culture may show various degrees of *adjustment*, from the adaptive point of view. There still remains, however, another set of problems to be considered with respect to cultural adjustment. These grow out of the fact (or assumption) that a cultural system is composed of discrete or distinguishable parts, and the problems lie in the question of adjustment as between said parts. This question of the internal adjustment of the component parts of a cultural system we shall refer to as the *functional aspect*. Thus, to use a very crude analogy, one may think of a formerly common experience with automobiles. At one time I had the use of an automobile well adapted to exploring the back country of the Southwest: it possessed the requisite high frame for clearing the high centers of desert tracks, the six-ply tires resistant to sharp stones, a heavy frame absorbent of shocks, a radiator of giant capacity and low boiling point. In short, it was *adapted* to the conditions under which it was supposed to operate. On my first trip, however, I was able to penetrate only some twenty miles into the desert with the vehicle; something was wrong with its insides. A rather prolonged and uncomfortable investigation in the midst of a sand dune demonstrated that a certain gear in the transmission had been inserted backwards. The car, so far as its relation with its external conditions were concerned, was well adapted, but it was *functionally maladjusted*. Thus also, I believe, a culture may be functionally maladjusted, due to internal inconsistencies between its constituent parts.

On the basis of the foregoing argument we may now put forward two general principles of cultural adjustment: the Principle of Compatibility, which refers to the adaptive aspect of a cultural system; and the Principle of Consistency, which refers to the functional aspect. We shall now discuss these so-called principles briefly.

One of the difficulties of dealing with culture has always been that its existence and its functioning are manifested to our senses only indirectly and only in situations of a certain type, i.e., situations containing components of the classes discussed below. This is another way of saying that all cultures are faced by certain general types of conditions to which adaptation must be made. These components of cultural situations are not culture, although at various times one or all of them have been confused with it. We have space to do no

more than to sketch the types of components in cultural situations, and it is understood that each "component" is actually a complex of factors in itself, which in specific cases must be specified and analyzed in detail.

1. *Hominid component.* Biological human beings are, of course, a basic component of every situation in which culture appears. It is the hominid component which must translate into customary activity the patterns of the culture. This being the case, the principle of compatibility requires that a culture be compatible with the activity potentials of the hominid component in its situation. In general, there is a definite range of activity potentials of which the human species is capable; i.e., walking barefoot head downward on a ceiling-like surface without the use of cultural equipment is definitely outside the range of human performance. In specific situations, the hominid component may show definite performance ranges narrower than those of the species as a whole; i.e., there are patterns performable by men of tall stature which are incompatible to men of very short stature, and vice versa, etc. A culture, in short, which contains patterns incompatible with the performance potentials of the human species or with those of the specific group whose customs it is supposed to guide, is, of course, maladjusted.

At present, these matters have not been sufficiently studied to enable us to be precise in every instance. We do not know with precision all the outside limits of performance of which the species or specific groups within it are capable. As such information is accumulated, formulations of this aspect of the theory of compatibility may be made increasingly exact.

2. *Social component.* A second general feature of situations in which culture occurs has to do with the potentialities for social relations. This should not be confused with the cultural patterning of social relations; it is, rather, the "raw material" upon which such patterning may work. The basic prerequisite of human social relations, of course, is that two or more human beings be in position to interstimulate each other and to interact to such interstimulation. Without social potentialities in the situation, customs, obviously, cannot develop. Furthermore, the social potentialities may differ in detail from one situation to another, depending upon the number of human beings in the situation, their distribution in space, their ages, their sex, their native ability to interstimulate and interact, the interference of environmental hindrances or helps, and the presence and amount of certain types of cultural equipment. A culture, then, escapes maladjustment insofar as its patterning is compatible with the social potentialities of its situation.

Many cases of "cultural lag" and "social lag" illustrate this form of incompatibility due to the persistence of cultural patterns no longer adapted to the existing social potentialities of the situation. For example, patterns of volunteer fire-fighting are incompatible with the social potentialities of a modern city of 600,000 population, in which the fire-fighters are spatially

scattered throughout a wide area. Yet these patterns still persist in the city of Lima, Perú, with the result that most large conflagrations burn themselves out before the volunteers can be collected in sufficient force to control them efficiently.

3. *Environmental component.* Each culture, of course, has to operate and be manifested in a specific environment. The environmental component of the situation includes all "natural" features except the hominid, the social, the psychological, and the artifactual components; it includes topography, physiography, flora, fauna, weather, geology, soil, etc., etc. The limitations which environmental conditions lay upon human social activity are sufficiently familiar to social scientists to require no extended discussion here. We merely mention that the patterns of a culture are bound by the principle of compatibility to environmental conditions, if the culture is to avoid maladjustment. For example, vertical plowing of rain-washed hillside farms is a pattern less compatible with the environmental component than contour plowing. Attempts to transfer middle latitudes culture to the deep tropics have repeatedly revealed serious incompatibilities and resulting maladjustments.

4. *Psychological component.* From the study of man as a biological organism it has been discovered that very few patterns for specific goal-oriented activities of the species are inherited through the germ plasm. Rather, they are learned or acquired by the individual following birth. In all other species, even those capable of some degree of learning, the bulk of the patterning of life activity seems to be governed by chromosomal characteristics of the germ plasm manifested at birth and/or during the processes of growth and maturation. With respect to man, on the contrary, the bulk of his life activity must be learned and the patterning of the majority of his learned activities is contained, not in his germ plasm, but in the culture of the situation or situations in which he spends his life. Thus, although the mere ability to learn may be regarded as a biological feature of the human beings in a cultural situation, the actual acquisition and performance of human customs cannot be adequately explained on pure biological principles. The principles in question have been developed (and we hope will be further developed) by the science of psychology, and the aspects of cultural situation with which they are concerned we term collectively the psychological component. The possibility of learning, but not the specific acquisition and performance of learned activities, is, in general, biologically given and is, therefore, referable to the hominid component. Likewise, the ability of the species, or certain specific groups within it, to perform certain activities may also be derived from our knowledge of the hominid component, but whether such performance will actually be acquired or maintained is a question which requires reference to the psychological component.

At present, the science of psychology has not arrived at complete agreement

concerning the principles of the acquisition and performance of learned activities. The present writer, who is not a psychologist, ventures to anticipate an eventual reconciliation of the Freudian Stimulus-Response, and Gestalt schools, doubtless with the addition of new principles, into a consistent body of psychological laws. Be that as it may, from the point of view of the culturologist, we may assume that, theoretically, the patterns of a culture are bound to be compatible with the principles and conditions of learning as existent in its situation, if the culture is to avoid maladjustment. To cite one example from the Stimulus-Response formulation, which maintains and has demonstrated experimentally that reward (i.e., lowering of drive) is necessary for the maintenance of any habit (learned response). Assuming this to be a correct formulation, we may say that culture patterns which do not entail reward are incompatible with the psychological component of their situation. Such patterns cannot be maintained in activity, and, hence, through failure of performance, are maladjusted as patterns. Certain groups in our own society no longer perform the patterns of voting, because they say it is "a waste of time," "we don't get results," etc. From this we might deduce that the pattern of voting requires certain readjustments.

It will be seen, also, that the psychological component is involved in all aspects of the customs which manifest the cultural patterns. Deviations between performance and pattern, for example, require specific analysis of the psychological component for their explanation; i.e., an analysis of the actual learning processes and their conditions in a given situation is necessary to reveal why certain patterns are incompletely learned, why they are not maintained in performance, why some individuals learn and perform better than others, etc. In general, we may say that, the greater the incompatibility between the culture pattern and the psychological component, the greater the deviation of actual activity from the pattern.

5. *Artifactual component.* A final principal factor in cultural situations consists collectively of the material results and adjuncts of human customary activities. For functional purposes, the artifactual component may be subdivided into (a) *material equipment* and (b) *material products.* All items of material equipment are of course material products (i.e., an arrow-head), although not all material products are functionally items of equipment (i.e., a slag heap at a smelter). The artifactual component pervades certain situations to such an extent and is so obvious to casual observation that it has more than once been mistaken for culture itself. The artifactual component, in our view, includes not only tools and material products fashioned by custom, but also "raw materials" and all other material objects which have been modified by custom either in their form or in their natural environmental relations in any such way as to enter into functional relations with customs.

The principle of compatibility, of course, applies to the relations between

culture patterns and the artifactual component of their situation. Thus, a pattern the performance of which requires an artifact not present in the situation is maladjusted. (Wartime "shortages" illustrate the type of cultural readjustment necessary when certain elements of the artifactual component are removed from the situation.) Also, the physical presence of an artifactual object in the situation, in the absence of a compatible pattern, results in maladjustment, illustrated, for example, by the dangers of "playing with fire" in both the specific and metaphorical senses. Numerous other types and instances of incompatibility with the artifactual component have been discussed in works dealing with "material culture," and many concepts deriving from this feature of cultural compatibility remain to be developed. Our purpose here, however, is merely to suggest the lines along which such development might proceed.

It may be well to point out at this point that we have been discussing in the foregoing pages for the most part questions of "simple compatibility." We must not leave these matters without suggesting that compatibility may be required in all degrees of complexity, and, contrariwise, incompatibilities may appear with similar degrees of complexity. A single pattern may be incompatible with only one element of a single component of its situation, or it may be incompatible with a dozen features of a single component, or it may be incompatible with all components, etc. To cite an example of relatively slight complexity, let us consider a pattern for war which involves a powerful handheld rifle. The pattern is compatible with the materialistic component, in the sense that artifactual rifle is present in the situation, can be held against the shoulder, aimed and fired in accordance with the pattern. The firearm, however, when it is fired, delivers a kick of 2000 pounds per square inch against the shoulder of its user. Most men firing it are killed by the recoil. The pattern in such a case may be said to be compatible with the artifactual component, but incompatible with the hominid component. A cultural system containing such a pattern would doubtless exhibit a number of inconsistencies, but we must discuss these matters at a later point.

In summary, then, we have suggested that the principle of compatibility governs the adaptive aspects of cultural systems, i.e., the relations of the patterns of a system to the components of its situation. Compatibility is concerned with that which is sometimes called the content of culture, i.e., the performability of the patterns.

We now turn to the question of adjustments within the cultural system itself. We have postulated as a basic requirement for cultural systems a certain degree of internal consistency.

We may start out by asking the question: What is a "good" cultural system, functionally speaking, as distinguished from a "bad" system? It seems that we cannot necessarily use the canons of logic—of whatever variety—as

criteria, for cultural patterns are in the last analysis the servants of the group of human beings whose activities they guide and also the products of this group or its predecessors, and groups are not necessarily logic-bound.

It seems that the test of a "good" cultural system, very broadly considered, is this: Does it satisfy the desires of the human beings involved in its situation? This would be a simple test were "human desires" a simple term. But it happens that human desires are of two general types: (a) desires derived from innate needs or requirements of the species, and (b) acquired desires. Thus the desire for food, however modified, is directly based upon an innate physiological drive; whereas the desire for money, or election to the Presidency of the First National Bank, or to the National Research Council, etc., may be based upon an "acquired" drive (prestige). Acquired drives and desires, being the product of learning, present a difficulty. The question arises: Are not acquired desires, or the patterns for them part of the cultural system? In our view the answer is negative, for the following reasons. We take the position that only *activities* are capable of patterning in the present sense, but not the motivations of activities. Both innate and acquired desires (drives, motivations) may underly (i.e., motivate) unpatterned as well as patterned activity. Random activity, for example, although undoubtedly motivated, is not patterned. There is, in short, nothing in a desire or drive *per se* which specifies the precise type of activity which may satisfy it. Once established, an acquired desire occupies the same functional status as an innate desire or drive. However, we may point out that, although cultural systems may not contain patterns for acquired desires or drives themselves, they may nevertheless (and usually do) contain patterns for (a) creating acquired desires, (b) arousing them, and (c) satisfying them.

Returning to our question of the test of goodness in a cultural system we may repeat, then, that such a system is "good" with respect to the degree in which it is capable of satisfying (a) human desires based upon innate species needs, and (b) insofar as it is capable of satisfying the desires which itself, the cultural system, or its predecessors, has created. The basic internal requirement is consistency, several aspects of which we propose to discuss below. First, we shall give some indication of the elements composing any cultural system.

The basic unit of a cultural system is a *pattern*. Let us suggest that each pattern is characterized by a *starting point*, a *course*, an *end point*.

In our view, cultural patterns are not necessarily mere translations to a social level of simple responses as conceived on the neuro-psychological level. A culture pattern, as we have said, should be compatible with all components of its situation and it should be consistent with its system. In fulfilling these requirements, a culture pattern may link together the "plans" or "specifications," as it were, for many unit responses, neuro-psychologically considered.

This is precisely one of the distinctive characteristics of culture, namely, its ability to connect together into adaptive performance on the social level the unit responses of which the species is capable. In a relatively simple pattern like brushing the teeth, for example, a good neuropsychologist could identify perhaps fifty-stimulus response units, yet, without knowledge of the culture pattern and its position in the system, his identifications would have little significance in terms of individual or group life.

Starting points are defined in terms (a) of their relation to other patterns in the system, (b) in terms of a configuration of stimuli and drive presented by the psychological component of the situation, or (c) in both types of terms. An example of (a): the tooth-brushing pattern's starting point is *after* the end point of the pattern of placing soap on brush, but in mid-course of pattern for bending over and straightening up from wash-bowl. An example of (b): gas in stomach arouses pain drive, which is starting point for symbolic pattern, "I have indigestion." End point of latter pattern is starting point for an (a)-type pattern, namely, ingesting bicarbonate of soda. An example of (c): subject is in restaurant under hunger drive and stimulated by odor of fresh doughnuts behind counter; pattern under consideration is that of dunking doughnut in coffee and ingesting same. Starting point of this pattern is defined in terms of drive and stimulus and also in terms of end point of two patterns to be performed by restaurant employee, namely, placing doughnut before subject and placing cup of coffee before subject.

It is perhaps necessary to remind the reader that we are speaking of patterns for action, not of action itself, Thus an engineer might pattern the action of a gasoline engine, i.e., cylinder No. 3 is not to be fired until after the firing of cylinder No. 1, but before that of cylinder No. 5. For want of gasoline or electric current, such a plan of performance for the motor may never be realized. So also, in given instances, for want of the necessary conditions the performance of a certain pattern of culture may not actually be performed. But this is not to deny the existence of the pattern or of its properties.

The *course* of a pattern consists of a succession of patterned (or projected) events leading to the end point of the pattern. Thus each course may be said to have *direction*. Again, the distinction between pattern and actual performance must be made. A course, for example, may be drawn between two ports on a nautical chart, involving a series of maneuvers on the part of the crew of a ship. Such a course, if properly performed will lead the ship to the distant port; but, if for one reason or another, the crew of specific ship A does not actually navigate this course, the latter's veridity and existence, as a pattern, are in no wise necessarily destroyed thereby.

The *end-point* of a pattern is, first, the point in the course at which no further activities are specified in the pattern. End points are also defined with respect to the same types of terms as starting points.

In the discussion of patterns we are inevitably led to the discussion of *goals*. One of the properties of the *course* of a pattern is direction, and we postulate that well-adjusted patterns are supposed to be directed toward specific goals. The end point of a pattern should be, as it were, contingent to a goal, should "lead to" a goal. In activity terms, the performance of pattern A should result, either by itself or in ordered conjunction with the performance of patterns B . . . X, in the achievement of goal A. From the foregoing statement it is apparent why we do not consider goals as parts or properties of patterns themselves: there are goals whose achievement is predicated upon the complete performance of more than one pattern.

A goal, dynamically considered from the purely systematic point of view, can be defined only as a specifiable, if momentary, change in the culture system to be expected following the performance of one or more specific patterns. If we take the cultural situation into account, we may say that a goal is the satisfaction, to a degree, of one or more innate or acquired desires (drives).

Goals are of two general types: *full goals*, and *sub-goals*. A more detailed analysis would doubtless show that goals can be further classified, with respect to a hierarchical scheme within the system. Likewise patterns may appear singly in a system, or they may appear in consecutive series, which we may call a *pattern train*. In a pattern train each unit pattern leads to a sub-goal, the achievement of which should be followed by the starting point of a second pattern, and so on, until the full goal is reached. In actual performance, a given individual or group may perform only one unit of such a pattern train, content with the satisfaction of the sub-goal for one particular performance. Thus one may perform the tooth-brushing pattern by itself, reaching only the sub-goal comfort resulting from removal of "film" on the teeth. On the other hand, the tooth-brushing pattern is so "set up" in our cultural system that, having performed it, a young lady, for example, may follow a pattern train of "making herself attractive" leading to the full goal of a marriage proposal.

One of the features of a culture's development seems to be increase in its complexity, and one of the features of cultural complexity is the subordination of former full goals to the status of sub-goals. Likewise, full goals become dependent upon an increasing number of patterns and an increasing intricacy of the ordering of their end-points in relation to the full goals to which they lead. Thus, at a primitive level of culture, a unit pattern starting with plucking of a berry from a bush may lead directly to the end point of popping berry into mouth and achievement of goal. On the cultural level of a metropolitan hotel a hundred unit patterns, involving dozens of "middle men" and batteries of cultural equipment, may intervene between bush and mouth.

Pattern trains, we may remark in passing, may take several forms and show all degrees of complexity in the ordering of their patterns. Let us mention only two forms: *linear* and *circular, or repetitive*. In the linear form pattern

A leads to sub-goal 1 followed by pattern B leading to sub-goal 2 . . . , etc., with pattern X leading to full goal I. Each pattern is to be performed only once in the series and, with proper ordering, the achievement of the full goal may be expected upon the performance of the last pattern of the series. Food-preparation pattern trains are usually of this type. In the circular or repetitive form, a train consisting of, say, four patterns and sub-goals may have to be performed, say, six times in succession before the full goal is achieved. Many pattern trains for the cure of obstinate physical ailments are of this type; one type of pattern-train for "making a sale" is a circular series of patterns to be followed until the "prospect finally cracks."

With respect to ordering of patterns within a train, we shall merely point out that the two outstanding criteria of order are time and place. As we have said, all degrees of complexity in ordering may exist. Order of time and place are, of course, essential features of a cultural system from the level of the unit pattern to pattern-trains to the achievement of objective. In the question of time-ordering in pattern-trains, let us mention two types: *instantaneous* and *delayed*. In baseball, for example, pattern A (hitting grounder to infield) should be followed instantaneously by pattern B (hitter running to first base). In agriculture, on the other hand, pattern A (fall preparation of ground) may properly be followed by pattern B (spring planting) only after an interval of six months.

Goals and the patterns necessary for their achievement *may* be grouped into what we may call an *orientation*. This term corresponds in some respects to the term "complex" as used in certain previous types of cultural analysis. When we reach this level we begin to see more clearly the potentialities of "independent" function of a cultural system. We have said that goals are founded in human desires, or drives, basing this contention upon the view that the patterns leading to goals could not be learned or maintained, were this not true. Orientations, on the other hand, may serve human desires or needs, but, we shall say provisionally, not necessarily so. We shall return to this point in a moment. First, we should say that an orientation may be regarded, on the systematic level, as a specified change in the cultural system to be expected following the achievement of a specified group of goals which constitute the "support" for the orientation in question. On the activity level, an orientation is manifested as a specified change in one or more components of the cultural situation, or in the configurational aspects of the same.

That an orientation is not necessarily in line with the satisfaction of desires or drives, either innate or learned, may be indicated by the fact that orientations are known to exist in certain cultural systems, consisting of goals so combined together as to produce a net result of early death for individuals, illness, and "unhappiness." In such cases, each supporting goal represents the satisfaction of acquired desires, at least, yet the overall result does not satisfy any

desire in the population. A group of goals such as drunkenness, narcotic stupefaction, and biologically excessive sexual indulgence may be expected to produce a state of affairs not desired by any of the practitioners, although each goal itself may satisfy an acquired desire. In such a case the orientation violates the principle of compatibility with the hominid components of the situation, of course, but may nevertheless persist up to a point in the cultural system.

Is an orientation merely an arbitrary grouping of goals by the anthropologist, or is there a functional connection between the goals comprising an orientation? The answer to the latter question is affirmative, in my opinion, although the actual placing of a label upon a particular orientation is the function of the social scientist in most cases. In our own situation, a portion of "higher education" in the social sciences is devoted to the task of enlightening students concerning the nature of certain orientations in our cultural systems: in other words to pointing out the "meaning" of certain groups of patterns, pattern trains, and goals.

An orientation is "real," (i.e., functionally existent) when it can be proved that the component goals, sub-goals, associated patterns and pattern-trains, are of such a type that they reinforce each other, i.e., that the performance and achievement of one set renders more probable the expectation of performance and achievement of each and every one of the component sets of the orientation. Thus there is evidence which seems to indicate that in the "decadent" culture of certain social categories of pre-war Paris, for example, alcoholism (the achievement of drunkenness) was particularly consistent with the taking of drugs and excessive sexual indulgence. On the other hand, among the Barama River Caribs of British Guiana, for example, drunkenness seems to be functionally coordinated with the "democratic" orientation, i.e., it may be expected to pave the way (remove the inhibitions) to the performance of other patterns, such as free verbalization of wrongs, discussion of community policy, etc., which, taken together as the "democratic orientation," result in individual participation in the decisions of the local group—juridical, political, economic, etc. On the other hand, drunkenness was definitely ruled out of the orientation of "precision manufacture" in pre-war France, and among the Caribs it is definitely ruled out of the "hunting orientation."

The next higher level of cultural organization in the present terminology would be the *trend*. A trend also may be defined in terms of the expected specific changes in the cultural system in which its realization results, and also in terms of the expected resulting changes in the cultural situation. The constituent and supporting components of a trend are orientations. There may, of course, be orientations in a cultural system which do not support any actual trend, just as there may be goals which do not support an actual orientation. One of the trends of modern civilization seems to be the "profit-and-loss"

trend. Not only behavior orientations appear to be organized into this trend, but hundreds of symbolic orientations as well. Money and its symbols appear throughout the component elements of the trend, but the functional efficiency of the trend depends upon the consistency among the various orientations which support it. Such various orientations as the training of graduate students (not necessarily the orientation of scholarship), certain "schools" of capitalist economics (symbolic orientations) and the piece-work system of labor management are probably to be found in this trend, although the exact identification of the trends of modern American culture is a subject for investigation. The pleasure trend, the mechanistic trend, the religious trend might be mentioned as possibilities.

The highest level of cultural organization we shall term the *objective*, which is an organization of specific trends. There is no definite number of objectives which a culture is supposed, *a priori*, to possess, but, when they exist, they are supported by large segments of the culture. It is even conceivable that a culture have only one objective, and that the whole culture compose it and support it. In any case, an objective is supported by many trends, orientations, goals, sub-goals, pattern trains, and patterns. There was a time when "winning the frontier" was one of the objectives of North American culture; at the present time, "winning the war" is such.

This long digression has seemed necessary in order to specify certain types of consistency seemingly required in cultural systems. In general we may say that *an inconsistency exists in a cultural system if the performance or achievement of any part renders incomplete or impossible the performance or achievement of any other part of the system.* In other words, two patterns, for example, will be inconsistent if the performance of A interferes in any way with the complete performance of B; goals A and B will be inconsistent if the achievement of one renders impossible or incomplete the achievement of the other in its proper order; etc. Cultural and social maladjustment may be expected to result.

The principal types of consistency would seem to be the following:

A. Consistency of form.
   1. Consistency of pattern with pattern.
   2. Consistency of pattern with goal to which it leads.
   3. Consistency of pattern train.
      (a) Consistency between patterns in a train.
      (b) Consistency between sub-goals within a train.
      (c) Consistency of patterns with sub-goals within a train.
      (d) Consistency of sub-goals with full goal to which train leads.
      (e) Consistency between trains leading to single goal.
   4. Consistency between full goals.
   5. Consistency between full goals and orientation of which they are parts.
   6. Consistency between orientations.

7. Consistency between orientations and trend of which they form a part.
8. Consistency between trends.
9. Consistency between trends and the objective of which they form a part.
10. Consistency between objectives.

B. Consistency of type
1. Consistency of symbolic patterns with actional and vice versa.
2. Consistency of symbolic patterns with representational patterns, and vice versa.
3. Consistency of representational patterns with actional patterns, and vice versa.

C. Consistency of order.
1. Consistency of time specification between two or more parts of a cultural system related with respect to time specifications.
2. Consistency of place specifications between two or more parts of a cultural system related with respect to space relations.

I believe that certain other notions, such as equilibrium, reciprocity, and effect, can be explained, for analytical purposes, in terms of the above concepts. This is not to deny that, from some other point of view than the analytical, such concepts might have an independent validity. Furthermore, I do not suggest that the above list exhausts all of the major analytical concepts applicable to cultural systems. Finally, it is, of course, obvious that the above general list may be broken down into numerous subdivisions, deductions, etc. which would require at least one large volume to elaborate.

Space permits only the most sketchy illustration of the types of inconsistencies which may appear through violation of these principles.

A. 1. One of the criticisms often levelled at coeducation is based upon inconsistencies of pattern which the culture of such a situation sometimes reveals. It is claimed that patterns of courtship and the patterns of scholarship usually coexistent in a college undergraduate culture are mutually inconsistent —the performance of the one renders incomplete or inefficient the performance of the other. (We shall let others decide this question, we merely suggest it.)

A. 2. A common pattern for the "cure" (elimination of deliterious effects) of snake bite in certain categories of our own society is to gulp immediately as much straight whiskey as one can swallow. The goal here is neutralization of the snake's poison in one's body. Medical evidence indicates that the pattern in question is inconsistent with this goal: ingestion of whiskey not only does not neutralize the poison, but actually, by increasing heart-beat and relaxing the blood vessels, aids in diffusing the poison through one's body. Many "quack" cures illustrate the same inconsistency between pattern and goal.

A. 3. In the "work-your-way-through-college" pattern train, two inconsistent patterns frequently occur: work eight hours at night (sub-goal: funds to pay expenses), appear in class next day prepared for recitation (sub-goal: pass-

ing, or better, grade). Although the two sub-goals in this segment of the train may be consistent, the two patterns in question are usually inconsistent.

A passing reference to B and C consistencies may be made by way of orientation. An inconsistency of the *B-1* class exists when group fantasies render actional patterns inoperative. We see this sort of inconsistency in certain types of "nativistic movements" and other phases of acculturation: the symbolic patterns of "the good old days" are of such a nature that the performance of new actional patterns designed to cope with the present situation cannot be performed effectively, i.e., are inconsistent. "Conservatives" in all cultures tend to exhibit this type of inconsistency, i.e., cultural maladjustment. Such maladjustment is sometimes labelled "lack of realism." At all events, there is an inconsistency between thoughts, fantasies, dreams—i.e., symbolic patterns —and actional patterns.

Inconsistency between symbolic patterns and representational patterns occurs in all cases of "faulty expression." We are told, for example, that the heart of German culture is, in effect, a set of symbolic patterns of exquisite beauty. If this is in fact true, we can only conclude that the representational patterns, even within the culture itself, to say nothing of their relation with foreign cultures, seem to be woefully inconsistent. In American culture, the question of whether or not the set of culture parts collectively called the "movies" are consistent as representational patterns with the symbolic patterns of our culture has been seriously discussed, although not precisely in these terms.

The relations between representational patterns and actional patterns may likewise be inconsistent. In certain Latin cultures (individuals in North Amer ica sometimes practice the same patterns) it is customary to substitute representational patterns for actional patterns with the result that certain actional patterns are rendered unperformable. For example, in one Latin American republic the present writer, at that time unacquainted with the local culture, was assured by the Minister of War that the Minister would immediately issue orders so that by the time the writer arrived at a certain river mouth a military boat with an outboard motor would be waiting to take the writer to a certain tribe of Indians. This statement (representational pattern) was made several times in the presence of the writer, the American Minister and several other prominent personages. When the writer arrived at the specified river mouth some weeks later, he discovered that the Minister of War had performed no actional pattern consistent with the representational pattern whatever; the local garrison had received no orders, and, of course, no boat was present. In this case, we may speak of a segment of a pattern train. Minister says "I will order that boat be ready when you arrive at such and such a river mouth." Writer says, "I will base my actions on this assurance." Follows a series of actional patterns performed by writer which leads him to specified river mouth. Once arrived there, however, he finds that his representational pattern ("I

will base my actions on this assurance") is inconsistent with the actional pattern of Minister of War, as was also his original representational pattern. Result is that writer is unable to perform next pattern in train, i.e., boating. Subsequent experience in this culture taught the writer that such inconsistency at that time was to some degree characteristic of the culture. (I am happy to hear that this type of inconsistency has since largely disappeared.) That such inconsistency may have a certain charm cannot be denied, but neither can it be denied that such inconsistency produces maladjustments. Also we must recognize that a group of individuals, may learn to live among lies. This is only to say that human beings are capable of making an adjustment to maladjusted cultural systems, but not to deny that systems which contain patterns for customary lying are inconsistent. Apparently, one of the difficulties of the late Mr. Chamberlain, Prime Minister of Great Britain, was the fact that he and his government were unable to make this type of adjustment to the representational patterns (lies) of Herr Hitler and the German foreign office.

Inconsistencies violating the *C* class are fairly familiar. We may sum this up by saying that a pattern which requires a single performer or group of performers to be two places at the same time is inconsistent, as is likewise a pattern which requires the instantaneous performance of two patterns unperformable instantaneously however consistent they may be otherwise. There is one possible exception, namely, the possibility of ambivalence, considered from the Freudian point of view, in respect to symbolic patterns. It is said that one can have an ambivalent attitude (symbolic pattern) toward a given object at one and the same time: i.e., one may both love and hate a given individual. In the first place, I do not believe that ambivalence has ever been minutely analyzed from the point of view of the time element. I believe that it is more than possible that one does not both love and hate at a single instant, but that one has the capacity either to love or hate a given object at a given instant. However, for the sake of the present argument, we may tentatively grant that ambivalence at a given instant is possible. We recall that we are speaking of cultural patterns, not of individual unpatterned responses. We may then grant that there may be patterns for ambivalence. If we grant this much, however, we claim that it is inconsistent that patterns for ambivalence and non-ambivalence should require simultaneous practice by the same individual at the same instant. A system, for example, that presents us with patterns which seem to require us to take a "judicial attitude" toward our enemies and also to hate them at the same time creates confusion, i.e., maladjustment.

The present article has been written as a preliminary contribution to a general overall theory of cultural adjustment, understood as the adjustment of a cultural system to its situation and to its internal requirements. We have postulated two basic principles of cultural adjustment: compatibility, which concerns the adjustment of the culture to the elements of its situation; and, con-

sistency, which concerns the adjustment of the component parts of a culture one to another. In an exposition of this restricted length, we have been unable to do more than sketch the outlines of such a theory. We have set out various specifications of these two major principles, and we emphasize again that such specification is of the most general nature, subject to considerably greater elaboration and refinement.

Finally, we should remind the reader again that concepts and postulates are always related to a frame of reference or point of view. In the present instance, we have been primarily interested in developing a guide to the analysis of cultural systems as such, and nothing more. One ultimate aim of humanistic and social sciences is presumably to develop a consistent overall body of theory embodying all legitimate scientific approaches and points of view to the study of man. The present informal discussion, whatever its deficiencies, should not be judged as an attempt to reach that objective in one fell swoop. The most that its author claims is that it may possibly be a small step in that direction.

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CULTURAL AND ORGANIC CONCEPTIONS IN CONTEMPORARY WORLD HISTORY

By MORRIS EDWARD OPLER

TO MOST cultural anthropologists nothing is more apparent than the independence of the cultural and biological in human history. To attempt to explain culture and culture change by means of biological factors is to commit the logical and mathematical folly of accounting for something cumulative and forever changing by a relatively constant and inert element. The truth is that *Homo sapiens* of the modern type has changed physically hardly at all in the 30,000 years or more of his existence. It is not merely that organic change is always slow, that, as Kroeber has pointed out, in organic evolution one organ or structure must be laboriously replaced by another if bodily form is to be altered.[1] In man there is this further complication; his very inventions may cushion him against natural pressures which would serve to initiate organic change.

Not only has the basic physical form of the species undergone very little modification during the long period of its existence, but the modern varieties or sub-species (races) have, as archeological evidence attests, existed in their present form since prehistoric times.

Yet, during this period of inconsequential bodily change, an amazing story of rapid cultural advance and accumulation has unfolded. This is particularly true of the last 6,000 years. From a being who possessed a few crude tools and weapons and who mastered some simple techniques, man, without the benefit of significant bodily change, has become the architect of a cultural edifice of intricate technology and detailed knowledge.

Most social scientists have quietly accepted the evidences of this disjunction between the cultural and the organic and have confined themselves to the study of culture as such without the importation of organic assumptions. But there is little evidence that political theorists, statesmen, politicians or laymen have been seriously affected by the newer point of view.

Indeed, in the years since Dr. Kroeber wrote his article (first published in 1917) calling for a social rather than an organic interpretation of man's behavior, the gulf between social and political action and the teachings of social science has increasingly widened. After the first World War this country, together with Great Britain, refused to support a proposed racial equality clause in the Covenant of the League of Nations. The 1924 Immigration Bill, often called the "Nordic Bill," was the supreme triumph of the organicists. It provided for total Oriental exclusion and discriminated against the peoples of southern and eastern Europe. Since 1917 there have been passed in various states, on racial or organic grounds, scores of acts of legislation penalizing por-

[1] *The Superorganic* (The Sociological Press, 1937), p. 3.

tions of our population in matters of sufferage, residence, marriage, education, and land ownership.

Before continuing, there is one subtle distinction which it may be well to explore, the narrow but real difference between the organic point of view and the racist doctrine. Perhaps the most succinct definition of the racist's creed has been given by Ruth Benedict:

> Racism is the dogma that one ethnic group is condemned by nature to congenital inferiority and another group is destined to congenital superiority. It is the dogma that the hope of civilization depends upon eliminating some races and keeping others pure. It is the dogma that one race has carried progress with it throughout human history and can alone ensure future progress. It is a dogma rampant in the world today and which a few years ago was made into a principal basis of German policy.[2]

It would be rash to suppose that all racists agree in every detail of their belief. The particular physical types on which they choose to lavish their superlatives may differ. There are Celto-maniacs, admirers of the Alpines, and supporters of Mediterranean preëminence, as well as Nordicists. Moreover, there are differences in the degree to which prominent racists have tempered their claims to fit nationalistic aims. Gobineau, the French forerunner of Hitler, was a restless globe-trotter without significant attachment to any one nation, least of all to his native France. His beloved "Aryans," the "one family alone" responsible for "everything great, noble, and fruitful in the works of man on this earth, in science, art, and civilization" he saw scattered throughout many countries, forming a natural aristocracy wherever they lived.[3] It was with this widely distributed "natural" aristocracy, rather than with any national entity that he identified himself, and he hoped for its triumph over the "rabble" everywhere. On the other hand, the principal English contributor to Hitlerism, Houston Stewart Chamberlain, definitely identified the superior "Aryans" with the Germans and greatly furthered the union of race ideas and national aspirations which has had its culmination in the formation of the "folkish" or "race-nationalist" notions of the Nazis. But these fluctuations of emphasis do not disguise the monotony of the racist theme. Always there is the recognition of a superior physical type to which past achievements are due and by which the future must be saved.

The organic view is more comprehensive than this. Its forms are more varied; its true character is more easily masked, even from its proponents; and it is therefore potentially much more dangerous. It includes the racist doctrine but it is not exhausted by it. It is possible to say that all racists are organicists but that not every organicist is necessarily a racist.

According to the organic view, which is held by millions besides Hitler and by many who fancy themselves stout foes of Hitler, progress or evolution in

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[2] *Race*, 1940, p. 153. [3] Gobineau, *The Inequality of Human Races*, p. xv.

organic life results only from struggle, and natural selection is the mechanism by which it proceeds. The mind imbued with the organic conception admits of no break in the combative process when the human level is reached. Struggle, competition among men as among lower animals, is still the task and the test; survival is still the reward. The pattern is projected as well into social and national life. Here, too, the body is the measure of a man's worth. Privilege, leadership, and opportunity in community life must be reserved for the "best" physical specimens. The attributes of the body which are deemed most important for continuing competition between organisms—health, vigor, physical might—become the highest goals. This attitude, projected into national and international policy, promotes an aggressive and imperialistic mood, a glorification of national strength, of war and conquest, and a cynical disregard of the rights of weaker neighbors or of those who dwell in undeveloped regions.

For an example of the difference between racism and organicism I call attention to the opinions of a professor of physical anthropology in an American University.

Professor Earnest Albert Hooton of Harvard is admittedly interested in questions of race, but he firmly denies that he is a racist. Speaking over America's Town Meeting of the Air in late 1939 he said: "We may be sure that no race has a monopoly of virtues or vices, and that there are no hierarchies of mankind by total racial ability. . . . "[4] But Hooton has also written, " . . . we must rid ourselves of the false prophets of cultural salvation and the witless preachers of human equality. The future of our species does not hang upon forms of government, economic adjustment, religious or social creeds, and purely environmental education. The future of man is dependent upon biology. . . . "[5] The organic point of view was never more boldly and more uncompromisingly put.

This theme, disaffection for culture and highest regard for the organic, is maintained throughout the book. In one place the author complains:

> Education is cultural and not organic. We have, it is true, something called physical education—childish grownups teaching games to growing children. . . . Etymological mistakes may be of no importance, but biological mistakes are. Our education is a failure, our social scheme a farce, and our mechanical science a peril. Man's culture is a vampire dummy which has sucked the organic vigor from its maker. . . .[6]

In another place but in the same vein, he writes:

> We all know what this world needs—not better machines, not more cunningly devised social institutions, not the fabrication of higher ethical and social codes, but better human beings: man, woman, and child, in every stratum of its population and in every country. Human evil is not a product of human institutions, but of human beings. The evil human being is the inferior biological organism. . . .[7]

[4] *Should We Ignore Racial Differences*, p. 12.
[5] *Why Men Behave Like Apes*, p. xxv. [6] *Ibid.*, p. 5. [7] *Ibid.*, p. 228.

It is important to recognize the general acceptance of such views because a smug and self-righteous tendency has set in to exculpate ourselves from responsibility for the "thinking with blood" that has made the world a shambles. Too many books and articles are being written which are content to find a purely German ancestry for organic thinking. It is reasonable enough to record the contributions to the historical growth of Hitlerism of Arndt, Fichte, Ranke, List, Bernhardi, Treitschke, Nietzsche, Wagner, Van den Bruck, Spengler, and the rest. But the work of those of other nationalities in this well-plowed field must not be overlooked.

At the very time when the Germans whose views are being so roundly condemned wrote and preached, Englishmen such as Francis Galton, H. S. Chamberlain, Carlyle, J. R. Green, Cecil Rhodes, Kipling, William Inge, Karl Pearson, and Arthur Keith were voicing sentiments which, in principle, are much the same. To the identical stream of thought Boulainvilliers, Gobineau, Lapouge, Le Bon, Broca, Maurras, Carrel, and many other Frenchmen added their offerings. Lombroso, Pareto, Ferrero, and Sergi are among the names which remind us of Italian interest in organicist and racist constructs. Even the smaller nations have important representation in the movement: Adolphe Pictet was Swiss and Hermann Wirth was a Dutchman.

An imposing array of apologists from the United States, too, have joined in building the theoretical foundations of organicism and racism. The giants of the past, Samuel George Morton, Charles D. Meigs, H. Holz, J. C. Nott, and George Gliddon were champions of slavery who sought to give the trading in blacks a scientific white-wash. Their arguments, discredited "facts," and rationalizations have outlived them and have become part of the American tradition; echoes of what they wrote can still be heard during any session of congress today. More recently such figures as Homer Lea, Charles C. Josey, William McDougall, Henry Fairfield Osborn, Madison Grant, H. H. Laughlin, T. L. Stoddard, and C. B. Davenport have added their influence and writings to the organicist cause. This is but a meager sampling from a long list of authors in all western countries who have stood fast for biology against culture. What we need is a history of the development of the organic view which treats it as a world-wide and not as a national phenomenon.

To understand why so many thinkers, some of them able men, have been attracted to the organic camp and to organic rather than to cultural explanations, one must have a clear conception of the nature of man and of the nature of culture. Organicism is the modern revolt against culture, man's regressive attempt to return to the womb of biology. *In this sense, the rise of the Nazis and the present war itself are simply a phase of the overshadowing struggle between the two world conceptions, the organic and the cultural.*

It has become trite for a social scientist to say, "Man is a cultural animal." Yet these few words point to the most poignant contradictions and strains

which provoke man to irrational and cruel behavior. Man can never ignore his animal origin, the importance of his body, or the needs of his body. The necessity to take nourishment, to eliminate waste, to satisfy the sex drive, to protect the body from the elements and from other inimical animals, and to heal the ravages of disease and wound, return man time and again to the humble primary factors which identify him with other living beings.

But if man is an animal, he is a unique animal. And it is by virtue of capacity for culture and the acquisition of culture that he is unique. The capacity for culture is a function of an accent on plasticity, on the development of general adaptability instead of specific structures, on the reduction of the importance of instinct. The inauguration of culture was heralded, we may believe, by the invention of tools and symbols. The tools, crude enough at first, were extra-organic means of doing what man had been forced to accomplish by the power of his own body to that moment. The symbols (generally understood vocal labels for familiar objects and processes) made possible communication (speech, language) and the conservation of whatever gains accumulated from tool-making and experience. Thus tools and symbols (or invention and communication, to phrase it in terms of process) can be considered the building blocks of culture.

In the beginning, when man's extra-organic possessions consisted of a few crudely sharpened flints, culture must have been merely a modest addition to what man could accomplish by his own hands and with his own body. But as tools were perfected, as inventions were added to a growing list, as possessions accumulated, the importance of the body as such became dwarfed by the vast array of objects and knowledge which each culture passes to successive generations of its carriers. The animal which became man now assumed a new role. Culture had magnified his strength many-fold. Instead of the be-all and end-all of existence, the body was now the central switchboard from which cultural activities were directed. Living was no longer a series of automatic reactions to instincts and needs; bodily needs there were, attenuated drives there were, but these were to be satisfied in terms of a culturally organized material world and a universe of social understandings.

The crux of this revolution, of this humanization, then, is not man's body, or changes of the body, but culture. Throughout the period of the emergence of culture and its evolution, the body has remained remarkably stable. Slow evolutionary change has occurred and will doubtless continue to take place, but there is no proof that the human animal is degenerating rapidly or, on the other hand, that he is on the verge of becoming Nietzsche's superman.

In fact, it is the disproportion between cultural change and organic flux that has provided our most worrisome intellectual dilemmas. Men realize that the vast majority of their ideals, ambitions, and satisfactions are rooted in or conditioned by culture. Living has become identified with the external and

the social world; too exclusive a preoccupation with one's own being is considered narcissistic or bestial. And yet in life and death, in health or decay, man is chained to that bodily shell through which alone his most creative moments can be expressed, and through which the outside world is filtered to him. For man, this body is the focus of deepest pleasurable sensations, but it is also the promise of pain, age, and debility. Even in the glow of health and youth man chafes at the limitations of the body. The books tell him of many a world he may not conquer, for time and mortality press upon him. It is no wonder that man shows marked ambivalence in his attitude toward the body. His vanity concerning his appearance and his physical prowess is matched only by his restless search for an immaterial, immortal soul. His cults run the gamut from phallicism to Buddhism.

If his physical heritage has been a disquieting influence for the human animal, his present preoccupation with culture has not brought him peace of mind either. The greater freedom from determining instincts and the growth and refinement of culture provide choices and demand decisions and responsibilities. No one has seen this more clearly than the biologist, Julian S. Huxley, who writes in his book *Man Stands Alone*:

> This increase of flexibility has also had other psychological consequences which rational philosophers are apt to forget: and in some of these, too, man is unique. It has led, for instance, to the fact that man is the only organism normally and inevitably subject to psychological conflict. You can give a dog neurosis, as Pavlov did, by a complicated laboratory experiment: you can find cases of brief emotional conflict in the lives of wild birds and animals. But, for the most part, psychological conflict is shirked by the simple expedient of arranging that now one and now another instinct should dominate the animal's behaviour (p. 22).
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> When we reach the human level, there are new complications; for, as we have seen one of the peculiarities of man is the abandonment of any rigidity of instinct, and the provision of association—mechanisms by which any activity of the mind, whether in the spheres of knowing, feeling, or willing, can be brought into relation with any other. It is through this that man has acquired the possibility of a unified mental life. But, by the same token, the door is opened to the forces of disruption, which may destroy any such unity and even prevent him from enjoying the efficiency of behaviour attained by animals. For, as Sherrington has emphasized, the nervous system is like a funnel, with a much larger space for intake than for outflow . . . (pp. 24–25).

It is precisely this responsibility and this challenge from which organicists recoil. They have lost faith, if they ever had any, in mankind's ability to regulate social institutions thoughtfully and to harness culture intelligently. One can understand their feeling that man has discharged his cultural duties inadequately. But one would have more sympathy with them if by their panicky retreat from culture to biology they were not leading us down the blindest of

blind alleys. Actually there is not a shred of evidence that taller men, or heavier men, or more muscular men, or Nordic men are likely to be kinder, more reasonable, or better able to grapple with our problems than the present population that graces the earth.

It is not difficult to understand why the quest for security, why fear of the breakdown of social institutions, leads so often to organic faiths and fantasies. The biologist deals with forms which have developed slowly and according to a recognizable pattern. Most of the organisms he studies show a high degree of correlation between form and function. Many of them achieve stabilization for millions of years. In the slow-moving history of a species there is seldom evidence of cancerous or uncontrolled growth; organs are modified or adapted to new conditions over long periods of time. For those who dread cataclysmic upheaval, this tempo and the relation to need and surroundings are reassuring.

To the individuals who like to conceive of change, if change there must be, as a measured process controlled by natural law, the mushroom growth of culture appears gargantuan, uncontrollable, and threatening. The gigantic forces which man is called upon to direct seem out of all proportion to his puny stature and strength; the consequences of easily made political or social decisions may be shattering. To those who cannot believe that man will ever be equal to his task, culture is the weird incubus, the unnatural phantom that terrorizes all the nights of the future.

Yet, however distrustful of man's capacity to control cultural forces they may be, organicists must come finally to realize that nothing they can do will ever restore the dominating role of organic factors in human affairs. That battle was lost to the organicists when man became man, a million years ago. There is not the slightest chance that the animal which has discovered its capacity for invention and communication will cease, as long as he exists, to utilize these proclivities or will fail to produce the artifacts and social forms which they make possible. What the organicists do not see is that culture has become as securely an aspect of man's being as any fact of his biology. As Warden has expressed it:

> . . . biological or natural man is radically changed during development by cultural forces. As will be seen, the culture pattern of the group is superimposed upon the individual from the moment of earliest infancy onward. By the time maturity is reached, the whole gamut of organic activities have been repatterned by cultural influences. This applies to the biological functioning of the body as well as to the more complex forms of social adjustment. In fact, the primary purpose of the cultural régime is to create a human being out of the growing animal.[8]

The attempt to retreat to biology is a bloody and futile gesture of despair. Culture and the problems of control and organization which it has brought

[8] *The Emergence of Human Culture*, p. 5.

can only be repudiated by insanity or self-immolation. Human history is the story of the diminishing importance of the body and the increasing importance of the superorganic or cultural.

It is not difficult to prove that the organic view, and the racism that is its modern phase, is the reaction of individuals and groups who seek desperately to block cultural adjustments which they fear primarily because they have become totally disillusioned with man's ability ever to keep the intricate cultural machinery running without disaster. In their frantic efforts to extricate themselves from unaccustomed cultural situations and to find their way to what they consider to be firmer biological ground, organicists seek to cut a Gordian knot, but they only succeed in severing that silver cord that unites them to all men and all human events.

The attempt of those who are insecure on a cultural level to find a permanent, stable, and lofty place for themselves in a racial hierarchy, has been exposed many times. "Race," writes Barzun, "appeals to those who find discomfort in relativity—hence its charm for fascists. . . ."[9] A long list of distinguished thinkers and investigators has sought to convey to us the degree to which organic thinking is a misanthropic revolt from one's culture and one's associates. More often than not, rebuffed utopianism and unrequited egocentrism are the distinguishing marks of the racist's personality. "Flaubert's desire to think himself a Norman Viking, and Nietzsche's pride in his Polish ancestry, are to be read as contempt for the French (Latin) Philistines of the 1850's and the German (Teutonic) Philistines of the 1870's respectively," says Barzun.[10] And elsewhere the same writer observes, "From Tacitus to Gobineau the great racial ideas have come from disappointed men. In modern Germany, which passes for the one instance of race-doctrine triumphant, the movement originated in despair. Van den Bruck wrote *The Third Reich* at the lowest ebb of national egoism and killed himself before the materializing of his pathetic appeal."[11] Max Lerner, in his essay, *Hitler as Thinker*, repeats Barzun's analysis with approval and carries it forward one step more: " 'From Tacitus to Gobineau,' writes Jacques Barzun in his informative book on *Race*, 'the great racial ideals have come from disappointed men.' He might have added that they have grown up in cultures in despair."[12]

The same strain of dismay and desperation has not escaped the notice of Bertrand Russell, who points out in his paper on the *Ancestry of Fascism:* "Fichte needed a doctrine which would make him feel superior to Napoleon; Carlyle and Nietzsche had infirmities for which they sought compensation in the world of imagination; British imperialism of Rudyard Kipling's epoch was due to shame at having lost industrial supremacy; and the Hitlerite madness

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[9] *Race*, p. 283. [10] *Of Human Freedom*, p. 157. [11] *Race*, p. 284.
[12] In *Ideas are Weapons*, p. 364.

of our time is a mantle of myth in which the German ego keeps itself warm against the cold blasts of Versailles . . . ."[13]

The relation between personal or national reverses and the retreat from cultural to biological premises is repeatedly exposed in Rohan Butler's study, *The Roots of National Socialism*. This is Butler's account of the disasters which left Fichte and the Prussians trying to rehabilitate themselves by visions of their biological superiority and the ultimate triumph of the force they would muster:

> Before the war of 1806–7 Prussia had comprised approximately 5,700 square miles and 9¾ million inhabitants: after it she was left with about 2,800 square miles and some 4½ million inhabitants. More than half had gone. It has been reckoned that during the two years in which the French were in occupation the Prussian reparations and contributions amounted approximately to one millard and 129 million francs. . . .
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> In the winter of 1807, when the fortunes of Prussia were thus at their nadir, Fichte, who had lately studied Machiavelli with approval, delivered in Berlin his celebrated *Reden an die deutsche Nation* (Addresses to the German Nation) which he gave to Germans for a new sign of the greatness of the nation, of their nation.
>
> Fichte entitled his fourth address *The Chief Differences between the Germans and the Other Peoples of Teutonic Descent* (p. 44).

The self-righteous withdrawal from the effort to control culture; the sorry attempt to disguise defeat and spiritual weakness by sneers and contempt, are easy to identify in the writings of one of the most influential of all organicists, Gobineau. Of his mood and convictions Butler has this to say:

> In 1853–5 Arthur de Gobineau published his *Essai sur l'inégalité*. In this treatise Count Gobineau, a bold thinker, gifted and original, expounded a doctrine that was the expression of a frigid and sustained despondency. This aristocratic French diplomat, ethnologist, poet, and sculptor felt in general only contempt and hatred for the age in which he lived, its works, leaders, and ideals; but he did not doubt that they were strong and would prevail; and so he nurtured his despair. The *Essai sur l'inégalité de races humaines* was its manifesto.
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> The pervading undertone of the essay may be rendered by the opening of one of Gobineau's own poems: "To the desert, to the desert, the wise and the strong!" For him human nature is essentially evil. "Man is preeminently the wicked animal." Human nature is not only wicked, but also weak. "Poor humanity! It has never succeeded in inventing a means of clothing everybody and preserving everybody from thirst and hunger."

National Socialism is organicism under the magnifying glass of fulfillment. It is in National Socialism that the nexus between despair and loss of faith in men and institutions, between defeat and aggression, are most starkly revealed. "When he sobbed on his bed at the news of the armistice," writes

[13] From *In Praise of Idleness*, p. 99.

Francis Hackett in *What Mein Kampf Means to America*, "Hitler was in chagrin at defeat. Defeat was unbearable. Hence the aggressiveness of his politics, the frenzy of his nationalism, and his subsequent 'fanatical confidence!' (p. 32–33)." It was this same Hitler who was to tell Rauschning, "Providence has ordained that I should be the greatest liberator of humanity. I am freeing men from the restraints of an intelligence that has taken charge; from the dirty and degrading self-mortifications of a chimera called conscience and morality, and from the demands of a freedom and personal independence which only a very few can bear."[14] That is the sentiment echoed by all organicists, the refrain of the weakness, the degeneracy, and the incompetence of man, of his inability to measure up to the responsibilities which the direction and control of institutions impose upon him. And, according to Mowrer, "Hitler so thoroughly fostered this feeling that you might hear National-Socialist students at Berlin University shouting in chorus: 'We spit on freedom!' (*Wir scheissen auf die Freiheit!*)"[15] This attitude, this abdication, this effort to gain security through identification with a biologically guaranteed mass movement, affected persons of all classes in Germany.

Such abject surrender has a history and a setting, and no student of the subject has questioned the part that defeat, despair, and humiliation played in it. In *People Under Hitler*, Wallace R. Deuel gives this picture of the moral collapse that paved the way for the Nazi triumph:

> Thus did the peoples lose their faiths in the only explanations of society they knew that give dignity and purpose to the lives they lived. They lost faith in the forms and processes that derived from these explanations and incorporated them. They lost faith in the leaders who had made or inherited these forms and supervised these processes. And the leaders lost faith in themselves (p. 369).

Nor have distinguished scholars failed to recognize the anti-cultural tenor and emptiness of the organicism to which Hitler has delivered the German people. "The Nazi system," in the words of Huxley, "is a negation of any civilized order. It is a form of black magic designed to exorcise the despair of men caught in the death struggles of the laissez-faire world; but it is negative, nihilistic, and can only advance by destroying."[16] In language that strikes at the very heart of the problem Peter Viereck declares, "Nazism is the revolt against conditioning by environment. Rosenberg denies that environment can give German morals or culture to, say a Jew or a Slav. Such qualities are determined unalterably before birth."[17]

And it is when he comes to expose the essential dishonesty and weakness of the Nazi and organic creed that Heiden, in his *History of National Socialism*, is

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[14] *Voice of Destruction*, p. 225.
[15] *Germany Puts the Clock Back*, p. 264.
[16] *Man Stands Alone*, vii.
[17] *Metapolitics, From the Romantics to Hitler*, p. 231.

most eloquent and convincing. Hitler had scarcely come to power when Heiden wrote these unforgettable words:

> . . . This (Nazi) doctrine claimed to teach heroism. In reality it lauded cowardice. The Nazi doctrine is inspired by the fear of progress, responsibility, and action. It seeks to escape individual responsibility by laying emphasis upon the necessity for obedience and dutiful acceptance of orders. It is inspired by fear of fresh storms and unknown stars. It is a protest on the part of the human body in need of repose against the restlessness of the intellect (p. 359).

It is essential to realize that those who claim the right to enslave or to sterilize their fellows are precisely those who have least faith in their ability to conquer or to control themselves. They are always the ones who seek justification for their actions in "natural law" or "inherent necessity." Time after time they reject freedom or intelligent choice as elements of their program. Consistently they interpret their deeds and reactions as the fruits of "intuition," "blood," or inescapable "race consciousness." They have exalted the body because they have lost faith in the intellect; they have declared unending war because they have not been able to make peace with their own humanity.

The story of the bustling industrialism which was disrupted by the First World War is too well known to describe in detail. Before 1914, because of the unprecedented forward surge in technology, manufactures, and communication, there grew up an implicit belief in progress, a certainty that scientific knowledge and man-made instruments were opening the way to a golden era of plenty. But in the absence of techniques for controlling relations between sovereign states other than a system of balancing alliances, a more prosperous and unified neighbor meant a potentially more dangerous adversary. There was the race for colonies from which to obtain the raw materials for industry and the competition for markets to which to send the finished products. What was seen as a conflict of interests ended as a conflict with arms.

The human and material losses of the war, the terror, strain, poverty, and disillusionment, brought a train of unpleasant consequences, great and small. Not the least of these was a changed attitude toward technology and human inventiveness. Millions of people, in an effort to allocate blame for their misery, cursed the new Frankenstein. They were shocked by the ease with which industry had been converted to war uses and by the results of that union. Movements sprang up which were, in effect, a repudiation of the machine as such. The post-war youth movement of Europe, and especially of Germany, was one of these, with its emphasis on the virtues of village life, folk customs, simplicity, and attachment to the soil. The Nazis were to make good use of these sentiments in their "Blut und Boden" propaganda later. In Germany, too, cultural forms were discredited on a broad domestic front. Governmental forms which had been considered unshakable disintegrated. The newly created

post-war institutions and instrumentalities were resented by the Germans, of course. From the League of Nations they were barred; the reparation system was punitive. Germans began to despair of lifting themselves from the morass by means of anything devised by the art of man; they began to harken to those who urged them to "think with their blood."

Even before this, Italy, torn and war-weary, was restless under the rule of an incompetent nobility and aristocracy. Here too, before long, there arose those who declared that Italy must be "saved" by a definite group, the fascist "elite." The ideal type of the fascist, it is true, was not at first defined somatically, but he had certain familiar characteristics. He was young, strong, resolute, ruthless, warlike and imperialistic. He desired discipline, order, and power instead of thought, freedom, and justice. Everything in the organic pattern is here. Characteristically again, there are the repudiation of cultural means for solving difficulties, the appeals to force and conquest, and the identification of these with immutable natural laws governing the relations of nations. Only those who do not understand the substance of the organic view and do not appreciate how readily it slips into a racist phase, were surprised when Mussolini announced the acceptance by the fascists of the Nazi race doctrines.

There is little reason for self-congratulation because the principles of the organic view did not become the official standard of evaluation in this country as occurred in some other nations. It might have happened here. It might still happen. The essentials of the cultural interpretation,—that those things which make us human and differentiate us from the animal are not organic but cultural, that character and morality are not causally connected with physical type but are products of education, training and tradition—are still far from being accepted by all Americans.

The Second World War is raging toward a climax. Hatreds and aggressions have been enormously sharpened on both sides. In our own country racial antagonisms have been increased and minorities are unsettled. Attacked as we were by racists and organicists, we might have reacted against them intellectually as well as physically. There is little indication that we have done so.

The greater struggle behind this war is the contest to determine whether man is to be judged and treated according to the characteristics of his body or according to his behavior. At stake is the determination of whether the principles of the Atlantic charter are to be applicable to all men, or only to men of a particular physical type. A military victory for the United Nations will not guarantee that human dignity everywhere shall be honored. Beyond survival and military victory lie that total victory, that triumph over "organic" thinking which may yet make us finally and completely human.

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BIBLIOGRAPHY

Ashley-Montagu, M. F., Earnest A. Hooton, Kirtley F. Mather, "Should We Ignore Racial Differences." *Town Meeting*. Vol. 5, No. 6, Nov. 20, 1939.

Barzun, Jacques. *Race: A Study in Modern Superstition*. New York: Harcourt, Brace and Company, Inc., 1937.

Barzun, Jacques. *Of Human Freedom*, 1st edition. Boston: Little, Brown and Company, 1939.

Benedict, Ruth. *Race: Science and Politics*. New York: Modern Age Books, 1940.

Butler, Rohan D'O. *The Roots of National Socialism*. New York: E. P. Dalton, 1942.

Deuel, Wallace Rankin. *People Under Hitler*. Harcourt, Brace and Company, 1942.

Gobineau, Joseph Arthur, comte de. *Inequality of Human Races:* translated by Adrian Collins, introduction by Oscar Levy. London, 1915.

Hackett, Francis. *What Mein Kampf Means to America*. Reynal and Hitchcock, 1941.

Heiden, Konrad. *A History of National Socialism*. London: Methuen and Company, Ltd., 1934.

Hooton, Earnest Albert. *Why Men Behave Like Apes and Vice Versa or Body and Behavior*. Princeton University Press, 1940.

Huxley, Julian S. *Man Stands Alone*. New York: Harper and Brothers, 1941.

Kroeber, A. L. "The Superorganic" (Reprinted by the Sociological Press, Hanover, New Hampshire, 1927, pp. 1–37). AMERICAN ANTHROPOLOGIST. Vol. 19, No. 2, 1917. April–June, pp. 163–213.

Lerner, Max. *Ideas Are Weapons*. New York: The Viking Press, 1939.

Mowrer, Edgar Ansel. *Germany Puts the Clock Back*. New York: William Morrow and Company, 1939.

Rauschning, Hermann. *The Voice of Destruction*. New York: G. P. Putnam's Sons, 1940.

Russell, Bertrand. *In Praise of Idleness and Other Essays*. "Ancestry of Fascism," pp. 82–108. George Allen and Unwin, Ltd., 1935.

Viereck, Peter. *Metapolitics, From the Romantics to Hitler*. New York: Alfred A. Knopf, 1941.

Warden, Carl J. *The Emergence of Human Culture*. Macmillan, 1936.

THE INTERACTION OF CULTURE AND ENVIRONMENT IN THE SMALLER SOCIETIES*

By JOHN W. BENNETT

ANTHROPOLOGICAL treatment of the problem of cultural-environmental relationship has usually centered upon the demonstration of completely random combinations of several variable elements. Statements like the following are typical: although a culture may fail to exploit completely the environment, it may be able to support a large population. A culture may over-exploit the environment, and support a population of similar size. A culture may be perfectly adjusted to a given environment, but still have a small population and be simple in form. And so on. Superficially, the ability to make these true statements indicates that no uniformities in terms of basic, universal processes can be found.[1] We feel, however, that these apparently heterogeneous relationships can be reduced to a certain order if we consider the matter from the standpoint of interaction between culture *types* and environmental factors, rather than from the vague concepts of "adjustment," "exploitation," "concordance," and others. A relevant analogy from biology would be the apparently random combinations of inherited characteristics in the higher mammals, which can be reduced to a series of uniform, albeit complex processes.

The purpose of this paper is to explore the possibilities for the erection of such general statements in the cultural-environmental field.

The Problem. The major interest of anthropological research on cultural-environmental relationships has been the determination of broad concordances between the two factors. That is, investigation of Culture A and Environment B is made with a view toward determining if Culture A is wholly within B, and has a distinctive character because of the fact it lies within B's boundaries. Kroeber's exhaustive study[2] of aboriginal North America concluded with a

* This paper is the product of two independent lines of research. First, we have used the results of some seven years of archeological work on the Kincaid and related sites in southern Illinois. These extensive sites are located on land owned by the University of Chicago, and have been excavated by the Dept. of Anthropology of that university. The author did laboratory research on Kincaid materials for over a year; he also spent two seasons in the field. Second, we will use data acquired by the Culture and Foodways Project of southern Illinois, a study of the interrelationships of subsistence and social structure in the modern cultures of the same region. This study was sponsored by the Social Science Research Council and was directed in the field by Herbert Passin. The author was a member of this project. (Cf. Bennett, Smith, & Passin, "Food and Culture in Southern Illinois," *American Sociological Review*, Vol. VII, No. 5).

[1] C. D. Forde, *Habitat, Economy, and Society* (New York, 1937), p. 464, states, "Between any two broadly similar regions the contrasts in detail in the precise conditions that are effective in the culture, to say nothing of the great importance of relations in space to other and contrasted physical and cultural regions, outweigh the significance of any generalization concerning them all." The term, "generalization," here refers to simple uniform types of environmental determinism, and we concur with Forde (and others) that general statements *of this type* cannot be made. (See also footnote 18).

[2] A. L. Kroeber, *Cultural and Natural Areas of Native North America* (University of California Publications in American Archaeology and Ethnology, Vol. 38, 1939).

detailed listing of many such concordances, with brief analyses of the significance of natural features in conditioning culture.

Kroeber's analysis makes clear that by and large, cultural-environmental concordances are most striking in the western and northern portions of the continent, particularly in the western United States and in the Eskimo area.[3] The reason for these concordances seems to be that unusual or difficult environmental types require an unusual and distinctive cultural adjustment. The eastern United States apparently boasts of no such striking correlations between culture and nature, possibly because a temperate, fertile environment with a minimum of natural barriers permitted a variety of adjustments, and archeology and ethnology have demonstrated that such was the case.[4]

The relationship of culture and environment in temperate, hospitable regions, however, has been a neglected problem—at least by the anthropologists. After demonstrating concordance between difficult environments and distinctive cultures, and after the reasons for such environmental determinism have been analyzed, anthropologists tend to leave the more fundamental question unanswered: what is the nature of *interaction* between culture and environment? In asking this question, we would assume that from a processual viewpoint, there would be no qualitative difference in the problems confronting a culture in a difficult and in a hospitable region. The concentration upon the unusual and striking cases of concordance has somewhat unwarrantedly given the impression that although a cultural "adjustment" to a favorable clime is necessary, it is simple and of little importance in understanding the problem as a whole.

By throwing weight upon one side of the issue in this manner, it is possible that many fundamental problems have been slighted and a distorted view of the matter obtained. If we followed the reasoning implicit in the usual approach, we would arrive at the following hypothetical statement: if difficult environments stimulate distinctive cultural developments, then hospitable environments should produce non-distinctive, uniform cultures. This is, of course, absurd. Cultures of favorable regions not only vary from one region to another, but they show great internal variation, as any study of the archeo-ethnological record of the American Southeast will show.

Although the reasons for environmental determination of such distinct cultures as the Eskimo are fairly clear, it is not immediately apprehendable why we find diversity of culture in more temperate regions. It is another ab-

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[3] *Ibid.*, pp. 204–216.

[4] Archeological research has shown the existence of certain concordances like Middle Mississippi culture and river flood-plain areas, which disappeared in historic times after tribal movements had disrupted long-standing cultural developments. Warfare played an important part in this disintegration and retraction from the river valleys, also.

surdity to say: it is because hospitable environments have no effect upon culture, and therefore culture is free to determine its own variability. This statement has broad validity when we apply it to our own greater society, with its technological abilities to control the environment, but it oversimplifies the issue when we consider the smaller "folk" or "primitive" types of societies. In these, the intensive efforts to secure an adequate food supply from the immediate environment introduce the general problem of environmental determination of basic sociological and economic forms.[5]

The problem therefore assumes two aspects: (1) The differences in cultural adjustments to difficult and hospitable environments. (2) The basic processual similarities in the interaction of culture and environment, in *any* environment. The major objective of this paper will be an elucidation of a few of the more important factors in these two problems. Our data will be derived from cultural and natural features in a Middlewestern region of temperate climate and fertile resources. We have at our disposal a variety of cultural developments extending over a period of some 800 years. All these cultures, including the modern, were relatively small, self-contained units.

If the clear, simple concordances mentioned earlier for the Eskimo and other cultures cannot be demonstrated for societies in hospitable climes, we must set up three alternatives: (1) Environment has had no effect upon culture, in which case the cultural variability must be accounted for on the basis of culture alone. (2) Environment had had an effect upon culture, but in relatively subtle and devious ways. (3) Both culture and environment have shared responsibility in determining cultural variability, and the processes of interaction have been complex.

With these in mind, but after a brief methodological note, we will consider the data at hand.

The general methodological framework used in this paper involves a technique of evaluation to determine the degree of complexity of a given culture. In this we follow to some extent the general folk-urban continuum[6] which is used by some social anthropologists. Thus the term "complex culture" will designate a relatively homogeneous culture, with a developed sense of group solidarity plus social organization—kinship, religious, and educational sys-

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[5] The best analytical discussion of the relation of subsistence pursuits to cultural form is R. H. Lowie's "Subsistence," in *General Anthropology*, Boas & Others, N. Y., 1939. However, the familiar anthropological emphasis upon "the multiplicity of actual developments" (p. 283) and "capricious irrationality" (p. 306) is evident in this outline of the problem.

[6] This approach is one variety of "constructive typology," a sociological method which consists of the experimental isolation of ideal-types of societies or social forms, and the use of these as control-points for the analysis of empirical data. The general method is used in all systematic social anthropology, but Robert Redfield and, to a certain extent, Ralph Linton are the only anthropologists to externalize the logical and procedural problems involved.

tems, and so on. For the purposes of this paper, a complex culture also displays organized segmentation and a relative abundance of artifact-forms.[7] We might also call this type, "developed folk." This approach permits us to place aboriginal and contemporary societies within a common frame of reference, and to a certain extent ignore their variant historical backgrounds.

Obviously the archeological cultures cannot be analyzed in terms of their "complexity," as defined above, to the same extent as can the modern societies. However, we feel that recent trends in the functional interpretation of archeological materials have provided us with a logic of probability that allows us to make many inferences regarding the vanished social forms of these cultures.

The Region. The tip of southern Illinois, enclosed between the Ohio and Mississippi rivers, was in both aboriginal and modern times a transition-zone between north and south. Physiographic maps usually trisect this relatively small area, giving equal portions to the central lowlands, Ozark plateaus, interior low plateaus; some include the Mississippi-Gulf plain.[8] Vegetation maps and studies tend to alternate between a classification of the area as temperate deciduous forest or river-bottoms forest, depending upon the relative weighting given the upland or riverbottoms areas of the region.[9] Geographically the region is intermediate and transitional between north and south; culturally, both archeologically and in modern times, a similar intermediacy is evident.[10]

This similarity between aboriginal and contemporary cultural positions, along with the factor of geographic transition, simplifies our problem by permitting relatively uniform control of basic variables. A fundamental environmental-cultural parallelism exists, and can be held constant through time.

The immediate area within the southern Illinois region we shall study consists of two counties bordering the Ohio river, at the extreme southern tip of the state. This area is composed of two major physiographic divisions: the *Bottoms*, a broad stretch of bottomland bordering the river; and the *Hills*, a

[7] In the contemporary societies "artifacts" refer to the level of material culture: houses, barns, machinery, household goods, etc. It should also be pointed out that when we speak of "complexity," we mean *internal*, *integrated* complexity. Thus the modern cultures, with their advanced technology and reliance to some extent upon outside urban centers, are in one sense more "complex" in that they are more differentiated. Internally, however, they lack the homogeneity required in our definition. We believe this definition is appropriate for the particular close-range, interactive analysis attempted in this paper.

[8] Cf., for example, Dowling, Fenneman & Thayer, *Physiographic Areas of North America*, map published by U. S. Geological Survey.

[9] Compare Shelford, 1926, with Shantz & Zon, 1924. The latter map, of course, is based upon a finer discrimination, which accounts for the recognition of riverbottoms vegetation. Harshberger, however, lumps southern Illinois into his Gulf-Coastal region, featuring pine-barren. (All maps from Kroeber, *op. cit.*)

[10] The region is intermediate agriculturally, too. (Cf. U. S. Dept. of Agriculture, Bureau of Agricultural Economics, *Map of Agricultural Areas in the United States*, upon which southern Illinois, along with northern Kentucky, southern Indiana, etc., are termed "Intermediate."

rolling, terraced upland constituting an extension into Illinois of the Ozark uplift. Flora and fauna, soil fertility, and to some extent climatic features differ in the two areas.

The Aboriginal Culture. Three distinct groups of American Indians occupied this region in the past, all of them previous to visitation of the region by white explorers and traders. Each of the three can be generally considered as a northern frontier relative of very widespread cultural horizons in the southeastern U. S. Their presence in this north-south transition zone resulted in certain modifications in their culture pattern, brought about through contact with other cultures.

By means of careful studies of archeological cross-finds, and by ethno-historical research, we can present tentative dates for these three groups: the latest culture, *Kincaid*, is given the span, 1500–1630 A.D. This date is relatively certain. The second group, *Lewis*, has been tentatively placed as 1300–1500; the third, *Baumer*, as 1000–1300. Previous to the Baumer occupation, the region was occupied by simple nomadic hunters who left such few, scattered remains that we will omit them from our discussion. These dates present us with a total period of about 620 years of aboriginal occupation. Our contemporary period begins about 1820 and continues to the present.

The earliest culture, Baumer, was settled in the Bottoms, along sloughs and on the riverbank. This was a simple hunting and collecting economy, possibly with a very simple horticulture. From a study of the midden and refuse-pit remains, however, the Baumer people subsisted principally upon the flesh of wild animals native to the Bottoms forest: deer, bear, rabbit, turkey, raccoon, and other species. Nuts and seeds of Bottoms species are also abundant. River foods were utilized (shellfish and fish), but not so intensively as were the land flora and fauna.

Baumer people lived in semi-permanent villages, with large square houses built with poles and bark. They made large quantities of a crude but serviceable type of pottery, and used simple but well-chipped stone tools. Cord and basketry were made from local fibrous plants. That the struggle for existence did not demand all their time is proven by the few simple polished stone objects which had a purely decorative or ceremonial use, and also by the few pottery vessels made for decorative purposes.

The Baumer adjustment to the Bottoms was essentially that of a hunting and collecting group placed within a region of such unusual natural fertility that a semi-sedentary life was made possible. Animals and wild plants constituted a permanent "crop," which permitted stable residence and the diversion of some human energy into creative activity; as evidenced by the pottery and stone objects mentioned above. The very simple horticulture, if present, doubtless contributed to this stability, but its importance in the total food supply, when contrasted to wild foods, must have been slight.

The second occupation of the region, the Lewis culture, was a Hills group, living along the terraces and bluffs of the upland area north of the Bottoms. The location in the Hills was the major occupation; in addition, a few sites are found in the Bottoms.

Lewis was broadly similar to Baumer in its economy, being a hunting and collecting group. It is doubtful whether horticulture was present; the evidence is not as good as for Baumer. The location in the Hills prohibited the use of the river for shellfish and fish, and even the few small Lewis sites in the Bottoms contain no fish bones or mussel shells. The flora and fauna of the Hills was less abundant than in the Bottoms; this may account for the presence of Lewis sites in the Bottoms. They were small hunting camps established to take advantage of the fertile resources.

Despite the fact that the subsistence-struggle was probably greater for the Lewis people in the Hills, their culture equalled and in some respects surpassed Baumer. Utilitarian pottery was equally-abundant but of finer construction; stone artifacts were cruder; houses were smaller but more solidly-built. In addition, the presence of stone-covered burial mounds suggests a ceremonial complexity greater than Baumer.

Although insufficient excavation makes our analysis more conjectural, it is our considered opinion that Baumer villages display a more "settled" life than do the Lewis sites. Deeper trash pits, heavier midden refuse, and numerically more-abundant artifacts in Baumer lead to this conclusion, despite the greater size of the Lewis sites in the Hills.[11] It seems that although large in area, the Lewis villages represent a relatively thin, less-permanent occupancy.

Lewis entered this region with a cultural tradition that was probably more complex than Baumer. Moreover, it was influenced by other cultures in such a way that a few new traits were added. But for unknown reasons, Lewis people preferred to establish their villages in the Hills, a region with fewer natural advantages. In order to maintain a fairly complex cultural tradition it was necessary to indulge in more strenuous pursuit of wild foods. This took Lewis hunters farther afield and led to a more dispersed existence. This fact may also explain the noticeable lack of polished stone decorative-ceremonial objects in Lewis culture. Sufficient leisure time for their production was lacking. On the other hand, the culture pattern dictated periodic observance of certain burial rites, displayed in the stone-covered burial mounds, which may be lacking in Baumer.

The third and final aboriginal occupation, Kincaid, has been found to have had several developmental phases. The earliest of these overlaps with the Lewis occupation. All the Kincaid sites are in the Bottoms. Culturally, the early period was hardly more complex from an artifact standpoint than Lewis.

[11] Lewis sites in the Bottoms are considerably smaller than Baumer sites, however.

However, corn agriculture was present from the very beginning. It is significant that the cultural features in this early period which are different from Lewis were the very ones which required a sedentary life and considerable time aside from subsistence pursuits. These were: small pyramidal mounds, larger houses, and more abundant ceremonial and ornamental objects. We feel that the presence of these traits can be partially explained by the fact that they were an integral part of the Kincaid cultural tradition; but we must remember that this tradition demanded the use of corn-squash (and probably bean) agriculture, which in turn permitted a more sedentary life. The very choice of the Bottoms as a location was made inevitable by the necessity for utilizing fertile, well-watered soil.

Kincaid exploited all other portions of the environment as well as the soil. Midden deposits reveal vast quantities of animal bones and seeds of wild plants, all Bottoms species, as well as very abundant fish bones and mussel shells. The use of the convenient environment was well-rounded and thorough, in contrast to the one-sided reliance of Baumer on natural foods and possibly a primitive horticulture, and to the difficult Hills-Bottoms hunting adjustment of Lewis.

In its later phases, Kincaid culture was considerably more complex than either of the two preceding groups. Huge pyramidal mounds, with ramps and stairways, were grouped in plazas and used as temple and public-building substructures. Village areas were placed away from this ceremonial precinct area. Houses and temples were large and elaborately-constructed. The large village area was completely surrounded by an elaborate palisade fortification. Pottery appears in two basic divisions, utilitarian and decorative-ceremonial, with the latter containing elaborate forms and polychrome coloring. Art forms were highly-developed: engraved shell, carved stone and semi-precious stones, molded clay and stone effigies, elaborate priestly costumes, and well-chipped ceremonial blades were present. Metal-working appeared in the form of copper ear spools and sheets.

From these various traits (and from early historical accounts of Southeastern tribes), we can infer a highly-organized social and political structure for Kincaid, with the population divided into two main groups: priests and tribal officials, and commoners. Division of labor must have been equally well-organized.

The Kincaid adjustment to the Bottoms was that of an agricultural people also utilizing wild foods to their greatest extent, so as to permit a sufficiently stable food supply which supported a population and a sedentary life that was adequate to preserve the complex cultural tradition.

In the preceding discussion we have emphasized the abundance of food in the fertile Bottoms, and the relative scarcity of natural foods in the Hills. But qualifications must be made. In the first place, establishing a village in the

Bottoms was in all likelihood a very difficult task, since it first required finding a spot sufficiently high so that it was not subject to standing water after each rain, and then clearing heavy undergrowth and dense forest from this location. Summer heat, humidity, and insect life made the Bottoms an unattractive spot in contrast to the more temperate parkland of the Hills.

These environmental difficulties in all probability operated as a limiting factor in Baumer and Kincaid culture. That is, if the same abundant food supply had been located in a more receptive environment, Baumer and Kincaid might have developed additional complexity within their traditional limits. We have no burials in Baumer that might give us a populational cross section, but the abundance of infant burials in Kincaid indicate a relatively high death rate. All Kincaid-like sites elsewhere contain burials which uniformly display, by skeletal evidence, an unusually high disease-rate; this fact is virtually a diagnostic trait of some Middle Mississippi horizons.[12] Some of these illnesses may have been functional products of riverbottoms environment. The rather sudden disappearance of these large, late, Middle Mississippi sites is often explained on the basis of disease.

These observations are too conjectural, however, to use in our analysis. We cite them only to point out the possible range of environmental influence.

In spite of the difficulties, Baumer and Kincaid worked out satisfactory adjustments to the Bottoms, in contrast to Lewis and the contemporary Bottoms culture, which we will discuss later. In the case of Baumer, the adjustment consisted of the utilization of abundant plant and animal life, to a small extent the riverine products, and almost ignoring the soil. This adjustment was essentially the same as any hunting and collecting group would make to any environment—there was nothing peculiarly "Bottoms" about it. Kincaid, however, was located in the Bottoms because it was an agricultural society and needed fertile soil with plenty of moisture. In this case the adjustment to the Bottoms was a deliberate one, not fortuitous, as in the case of Baumer. It is significant that while we find Baumer-like sites established farther north and to the south with little regard for river and stream courses, we never find Kincaid-like sites away from fairly large rivers. The important fact here is the existence of flood-plain agriculture. We therefore find a high concordance bebetween all-late Middle Mississippi sites and large river-courses.

The Lewis people preferred the more salubrious Hills climate to the less-temperate Bottoms, even though they probably relied upon Bottoms wild life for most of their food. Cultures closely related to Lewis tend to show this same non-bottomland location; indeed, some of Lewis' closest relatives are found in the prairies and eastern plains. In this case, therefore, the choice of residence

[12] The main Kincaid burial ground has not as yet been discovered, but the few skeletons found to date indicate identity with other Middle Mississippi types.

was governed by cultural tradition entirely, although unlike Kincaid, the tradition itself to some extent interfered with the most efficient collection of a food supply. If Lewis had accommodated itself entirely to the Bottoms, the potentialities for a Kincaid-like development were great, because there were certain traditions in Lewis that foreshadowed Middle Mississippi. Corn agriculture was lacking. In western Tennessee, a Lewis-like people did possess agriculture, and a Middle Mississippi-like development occurred.

At this point we can summarize these observations:

Kincaid: Cultural tradition, degree of utilization of natural resources, and environmental conditions coincided. Result was a highly-developed, well-rounded culture, with a fairly large population.

Lewis: Cultural tradition coincided with environmental features, but did not coincide with available natural resources. Cultural development therefore inherently limited. Population relatively small.

Baumer: Cultural tradition and natural resources fortuitously coincided at one point: wild game and plants. But the lack of further exploitation limited cultural development. However, fertile environment permitted a more sedentary existence than in Lewis. Population relatively small.

It is evident, of course, that the "limitation" of cultural development in Baumer and Lewis in not solely the result of a failure to exploit the available natural resources. We can also phrase it this way: the failure to exploit the environment is part of the total cultural tradition which determined the adjustment to the environment.

The Contemporary Cultures. We are fortunate in our study of the modern societies in that we possess documentary and oral historical data going back to the 1820's. This, plus the recent research done in the field, allows us to trace the differentials of adjustment in a more certain fashion. Our discussion will therefore be brief and concise.

Save for a few land grants, many of the earliest white settlers in the region shunned the Bottoms, considering it a dank, disease-ridden jungle, and established their farms in the Hills. This can be explained by the fact that most of these early white settlers were Old Americans from Kentucky and Tennessee who entered southern Illinois with a small-hill-farm tradition. Like the aboriginal Indian groups, they followed their particular tradition in their new home.[13] Those people who did settle in the Bottoms followed this same culture pattern.

The culture of this Early period in the Hills and Bottoms was typologically folk: strong kinship relations; centralized religious authority; homogeneity of traditions and sanctions, producing firm social control; self-subsistence; sense

[13] Cf. H. Passin, *Culture Change in Southern Illinois* (Rural Sociology, Vol. 7, No. 3), for a discussion of the early period in the region.

of group solidarity; complex interrelationships other than purely economic inter-dependence; collective action and periodic ceremonial gatherings of various kinds. Although the historical background is utterly different than that of the Indian culture of Kincaid, from a typological standpoint the two must be more or less equated—they are both developed folk cultures; in our term, "complex."

It also appears that the relationship to the environment was basically similar. Like Kincaid, the early Hills-Bottoms modern culture hunted wild game and gathered plants, using these natural foods to buttress the agricultural food supply. The only difference lies in the slightly greater emphasis placed upon agriculture (and stock-raising) in the Early modern culture, and the almost complete reliance upon corn and beans, in agriculture, and wild animals instead of domesticated, in Kincaid. The difference, however, was one of degree; the important factor, the adequacy of the food supply, was sufficient in both cultures to permit a full folk development. The type of *interaction* was similar in both: direct use of the environment plus the technological alteration of the environment.

As the population grew, and as the available land became scarce, newcomers began to clear the Bottoms, establishing small farms similar to those already in the Hills. This custom lasted a relatively short time, however. Since Bottoms land was cheap, and known to be very fertile, well-off men began to secure large tracts, establishing plantations, with the former owners remaining as tenants. These farms exploited the rich bottomland to its fullest extent, and took advantage of the luxurious undergrowth by grazing cattle and hogs. Farming in the Bottoms and in the Hills took on a contrast as sharp as that between a Louisiana plantation and a Kentucky hill farm.

This contrast, despite the disappearance of the semi-feudal plantation system in the Bottoms, is still sharp. Tenants now operate the large Bottoms farms on a sharecropping system. The number of tenants has been reduced by four-fifths, as a result of agricultural mechanization. Hills farmers own their own land and hope to be able to rent a field in the Bottoms to grow a decent corn crop, since Hills land has nearly worn out. With the gradual exhaustion of the soil, Hills farmers now find it necessary to forage in the Bottoms, like the Lewis people in aboriginal times, in order to make a living. Thus the basic environmental features still affect cultural forms in similar ways.

The results of this environmental influence, however, are quite different. In the Kincaid culture, the fortunate concordance of cultural tradition and environment permitted a full cultural development. Much the same situation held for the Early modern culture. The contemporary Bottoms culture, however, although based upon an intense exploitation of the natural environment, but in this case soil alone, is meager, fragmented, and economically-wasteful. The basic economic adjustment is such that tenancy is a precarious and ex-

hausting existence, and this causes high familial mobility, giving the culture an impermanence and lack of institutional development.[14] It is hardly as complex as our inferential reconstruction of Kincaid, and certainly not as complex as the Early modern culture. The impact of urban alternative values, to use Linton's term, has resulted in atomization and a growing dependence upon the outer world for subsistence. The food supply is precarious and often inadequate, since money is usually scarce and gardens are poorly cared for.

The Hills people, though now required to rent Bottoms land if they wish a profitable corn crop, nevertheless have a well-organized, institutionally-complex culture in contrast to the contemporary Bottoms.[15] Compared with the Old modern culture, however, the present-day Hills also represents a disintegration from the old developed folk type; a result of the gradual wearing out of the soil plus the differentiating effect of urban values and growing dependence on urban economy. The interaction here has been similar to that of the Bottoms, but the Hills culture preserved a core of functional pioneer values and interconnectedness that was destroyed in the Bottoms with the advent of tenancy.

In the contemporary Bottoms, the culture is subordinated to the environment in that the entire institutional development is directed toward the difficult task of profitable production on the large farms. In the Hills, production *per se* is not the goal, since the farms are owned, and self-subsistence is the major task. Cultural goals are characteristically verbalized in terms of nicer farmhouses, refrigerators, college training for children, and so on. The gradual cultural selection of highly adventurous, mobile individuals in the Bottoms eliminates such middleclass goals; Bottoms people are merely interested in making a living. Briefly, in the Bottoms the people exist for the environment, while in the Hills the environment exists for the people.

What precisely has been the interaction between culture and environment in the Bottoms? Given the basic geographical fact of an extremely fertile, flat, moist region adjoining an unfertile hilly area, it was inevitable that a culture of this economic type should have developed a tenancy system in the Bottoms. The roots of tenancy can be found in the individualistic economic tendencies in our rural society; these roots will flower if geographical conditions are appropriate. In the case of the contemporary Bottoms, then, the interaction of culture and environment has resulted in a limitation of cultural development.

In the Kincaid period, interaction took place on a simpler level: the cultural

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[14] Cf. the author's paper, *Some Problems of Status and Social Solidarity in a Rural Society* (Rural Sociology, Vol. 8, No 4. 1943).

[15] Hills barns and houses are better-constructed; machinery is better and well-cared for; kinship systems are complex, with all families related; farm bureau activity is fairly well-organized; church attendance is high. All these features are either lacking or slightly-developed in the Bottoms. But even in themselves, they are much weaker than the Early modern culture.

tradition demanded and received a flood-plain terrain. Since this demand was met, the socio-economic pattern developed fully, the result being a full, complex culture offering sharp contrast to the modern conditions.

In the Hills, in aboriginal times, the Lewis people never developed a more complex culture because of their own traditions, plus a difficult subsistence problem. This is opposed to the contemporary Hills culture, where we have in spite of poor soil,[16] the most complex culture of the whole region. In this latter case, cultural tradition was stronger than environmental limitations—it survived the impact of urbanism and altered the environment in such a way as to insure a measure of security.

From the earliest stage of the contemporary period, semi-nomadic shanty-boat dwellers drifted back and forth on the river, tying up at recognized spots on the Bottoms shore. In the early days, they hunted Bottoms animals and raised a patch of vegetables on the sandy bank, or traded fish for farm products with farmers. At the present, these people beach their boats, permissibly "squat" on tenant farm property, and for their "guard duty" against river thieves, they can pick all the corn they wish, and receive seed for bean and potato patches. They also fish and hunt Bottoms animals, such as are left. Their adjustment to Bottoms environment is basically similar to the Baumer aboriginal type: a fortuitous use of Bottoms fertility with very little institutional development or close functional interaction between culture and environment. In terms of the modern historical development, the river people represent an accentuated case of the same destructive processes at work in the modern Bottoms culture: economic exhaustion, conflict with urban values, and increasing unorganized social differentiation.

Conclusions. Recalling the three alternatives presented in the section on problem, we must recognize that (3) fits the data most closely. Both culture and environment had had a hand in determining culture form and complexity in this region. It is equally apparent that the interaction of these two factors has been intricate—more so than in a distinctively simple case like the Eskimo and the Arctic.

The problem now arises, what is the nature of this interaction in each culture discussed, and what comparable processes have been at work?

We stated at the outset that the logical structure of this type of problem consisted of a series of permutations composed of the constituent variables. Another example: although a culture may fail to completely exploit the environment, it may achieve a fairly successful adjustment insofar as it supports a constant population and preserves cultural tradition. This may be particularly the case if there is a high concordance between distinctive culture and

[16] In aboriginal times the environmental lack was game animals and wild plants; at the present time it is in the poverty of the soil.

environmental type. We call this situation "fairly successful" because the culture has modified its socio-economic structure to take advantage of many convenient natural resources, but not necessarily all. If we alter one variable, "concordance," and call it *low*, we must revise our judgment and call it "successful," or "very successful," since the culture has demonstrated considerable resourcefulness in sustaining itself in an environment not suited to its particular socio-economic system. "Exploitation" also varies, inasmuch as the culture now exploits the environment to a relatively greater degree.

The difficulty with this way of describing these situations lies in the lack of precision in such vague concepts as "exploitation," "adjustment," and "concordance." These have considerable utility in general discussion, and we have so used them throughout this paper, but they lack clarity for real analysis.

Secondly, the evaluative goal of the permutation-type of statement is necessarily a qualitative judgement: "successful," and its modifiers. For casual discussion this may serve, but if we wish to see if uniform processes tend to accompany culture types, we cannot use a valued, non-typological analysis.

Now let us suppose that we can conceive of a situation in which both culture and environment would have absolutely equal weight in determining the form of a particular culture pattern. Each element would have an equal responsibility. This ideal-type construct we will call *cultural-environmental balance*, and we can visualize it as one end of a continuum, at the other end of which we have the construct, *im*balance.

If we inspect the descriptions of our various cultures, we find that some show relative balance (i.e., culture and environment share responsibility in determination of culture form), others, imbalance (i.e., one element tends to outweigh the other in determination of form). But further, that some of the balanced and imbalanced types show greater or lesser complexity. Or more simply stated: balance and imbalance do not *necessarily* imply greater or lesser complexity. We will recognize this situation by adding the terms, *positive* and *negative* to each of our ideal types.

A discussion of each of the cultures in terms of these constructs follows:

Kincaid and Early modern cultures: Cultural tradition very strong, included a complete exploitation of environment. Environment such that this tradition could be developed to greatest extent, allowing for some restraint from such adverse features as heat, insects, etc. In comparison with all other cultures, however, the interaction of culture and environment was in a state of balance; both cultural and environmental factors worked harmoniously to produce a developed folk culture. We will call this *positive balanced interaction.*

Contemporary Bottoms: Cultural tradition fairly complex in beginning, but was prevented from continuing by environment working through specific economic system. Economic system causes high mobility and lack of institutional development. Exploitation one-sided, soil only. Cultural determination outweighs contribution of environment. We will call this situation *negative imbalanced interaction.*

Lewis: Cultural tradition relatively simple, environment had limited resources. Culture required to provide for additional food by dispersal of residence. This restrained cultural growth to some extent. This should be distinguished from modern Bottoms, because Bottoms culture once was complex, but has become fragmented and differentiated. In Lewis, comparative evidence shows tradition always fairly simple. Balance between culture and environment, but culture so simple that full exploitation of environment prevented. Therefore we will call this *negative balanced interaction.*

Contemporary Hills: Cultural tradition was strong and complex enough to resist tenancy system development, and also, to overcome environmental limitation of poor soil. Since the cultural factor has proven dominant over environment, but in such a way as to preserve a relative complexity, we must call this *positive balanced interaction.*

Baumer: Cultural tradition simple; environment fertile. Environment exploited fortuitously. Resources so ample, however, that they permitted a more sedentary life than in Lewis. Interaction basically similar to Lewis (negative balance), but is farther toward the positive pole, since the environment, through its exceptional fertility, has contributed toward culture development.

River People: Type of exploitation similar to Baumer: fortuitous. Degree of exploitation much less, however, and much greater dependence upon other cultures. Very simple and atomistic; the least complex society of whole region at all times. In early days, hunting, fishing, and some agriculture made the interaction basically similar to Baumer-Lewis, negative balance, but at the present time this has shifted to *extreme negative imbalance,* since the culture is disintegrating as a result of a lack of any techniques for furnishing adequate food supply.

Our analysis, therefore, has presented us with the polar concepts of balance and imbalance, and the negative and positive poles of each, and also with cases of varying degrees of each. Cases of transition between each ideal type were also noted.

It should be emphasized that "imbalance" need not imply an unsuccessful adjustment, since in the case of the modern Hills culture, the imbalance has led to the relative preservation of a fairly complex culture and fairly successful exploitation of an adverse environment. It is interesting to note here that the culture is beginning to adopt principles of soil conservation, which is operating as a stimulus to further homogeneity and integration, since it increases crop yield and intensifies the reliance on Hills soil, thereby encouraging the old self-subsistence values.

It is evident, however, that Kincaid and the Early modern culture, both with positive balance, achieved the most complex cultural expressions of all the groups, aboriginal and modern.[17] Comparison with other developed folk

[17] Here, as before, we define "complex" as internal, integrated complexity—organized segmentation as opposed to differentiation. Thus Kincaid, with its inferred social system, elaborate ceremonial system, defense structures, religious-political village plan, and complete self-produc-

cultures suggests that this condition of positive balance is indeed a prerequisite of an enduring, homogeneous culture. We are not certain of the positive correlation of positive balance with complexity, but the linkage with relative temporal persistence seems clear. It also seems evident that the condition of negative imbalance is associated with the least-complex and most differentiated cultures, and may also foretell the eventual disappearance of those cultures—all other factors being equal.

Historical conditions must be carefully analyzed, however, before normative types be established. It is also necessary to consider the content of the culture to ascertain the reasons for any given type of balance. In the modern Bottoms, the environment helps to limit cultural growth indirectly, through the particular economic system; whereas in the case of Baumer, it was the totality of cultural tradition that prevented a fuller use of the environment. The result, cultural limitation, was comparable in both, but the interactive processes varied.

Following the lead given us by these suggestive, if imperfect, correlations, we might formulate some hypotheses relating to the interaction of environment with certain culture types.

We postulate: small homogeneous societies, with conservative, homogeneous traditions, tend to show, like Baumer and the river people of the Early modern period, a negative balance between cultural and environmental factors. Small heterogeneous societies, like the modern Hills, with a dependent economy, but with relative persistence and resistance to alternative values, tend to show a positive imbalance. Extreme cases of dependence and heterogeneity, where resistance has broken down and differentiation is acute, like the modern Bottoms, show negative imbalance. Societies somewhere in the transitional zone between these extremes, which we have called "developed folk" (like Kincaid and the early modern culture), may tend to show positive balance.[18]

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tion of food and material culture, presents us with a picture of integrated complexity far beyond the contemporary level, with its lack of internal cohesion; institutional poverty, and its dependence upon the outer world. The contemporary Hills, however, closely approached the Kincaid-Early modern level of complexity.

[18] It is important at this point to review some of the sources providing a background for this general viewpoint. Karl Ritter, the pioneer German anthropogeographer, was the first scholar to demonstrate systematically that geography had the greatest influence on primitive peoples, while the civilized cultures showed a diminishing importance of geography and greater importance of culture and "mind" as determining factors of a given adjustment (Vide *Ritter's Geographical Studies*, trans. by W. L. Gage, N. Y., 1861, pp. 249, 273 ff.). Ratzel's primary contribution to anthropogeography was the concept of reciprocality in regard to the man-nature duality, rather than conflict; an idea which was developed somewhat further by the French geographer, Reclus. Ellen Semple (*Influences of Geographic Environment*, 1911) carried the Ratzel tradition into more deterministic channels, re-emphasizing Ritter's distinction. Miss Semple also distinguished important types of geographic influence from each other: physical, psychical, economic, social. Up

These ideal types must be regarded as hypotheses upon which further investigation could be based. Obviously as they stand they are too simple and fail to include proper subsidiary hypotheses related to the causative structure of the problem.

The underlying philosophical position might be stated as follows: "Environment" and "Culture" are viewed as variables within a total interactive process, rather than as "different levels of reality," or some such descriptive formulation. This view is made possible by recognizing that the organism or culture defines its own environment by its distinctive type of response to its surroundings.[19] The environment of an amoeba is quite different from the environment of a goldfish, although the two may be side by side in the same body of water. Hence it would appear that the more complex the organism, and the culture, the greater the number of responses to the surroundings. Such increases in responses, and corresponding increases in experience, lead to fuller use and control of the environment. Thus in small folk societies the chances of utilizing the environment are less than in the more complex developed-folk type, and still less than in the contemporary urban-civilized type. Our problem is how to analyze this process and to develop the proper types. Mathematical formulations, as attempted by several ecologists, are limited to small-scale situations, and break down when complex cultural variables are introduced.

If these hypotheses should have any validity however general, it would be indicative of an underlying uniform set of relationships between culture and environment that would hold true in any environment and in any culture of the same typological varieties. Thus all developed folk cultures, whatever the historical backgrounds, will tend to show positive balance. We say "tend"; this word admits of the possibility of other conditions interfering in special

to this point the tendency was increasingly deterministic, and accordingly reached its peak in Alfred Kirchoff, who turned the primitive-civilized distinction upside-down, when he pointed out that the increasing exploitation by civilized man did not free him from environmental influence—on the contrary, " . . . it is always knitting him with it more and more intimately . . ." (*Man and Earth: the Reciprocal Relations of Man and His Environment*, London, 1914, p. 108). The reaction to the determinist tradition appeared even before it reached its height; Febvre is an important name, and in later years, Carl Sauer. Ecology played an important role in the growing interactionist-relativist position. But even more significant is the fact that American "historical" anthropology was deeply involved in the controversy. Anthropology's role was polemic (as it was towards evolutionary anthropology) in that determinism was shown to be one-sided and a priori, by an overwhelming demonstration of the tremendous diversity of cultural adaptations to and in spite of environments. In this paper we take a position somewhere between the deterministic and relativistic poles: granting the diversity, we feel that generalizations of a certain order can be made. We take as our fundamental postulate the old Riterian concept, and proceed from there in a more systematic, typological direction. An important basic distinction is made between cultural *content*, which is diverse, and *structure* and *process*, which display significant uniformities from culture to culture.

[19] Cf. G. H. Mead, *Mind, Self, and Society* (University of Chicago Press, 1934), pp. 245–252.

cases—our predictability, as in all social science, is not 100% inclusive. The "processes" involved in positive balance are: direct use of the environment plus alteration and adaptation of the environment to adequately reinforce subsistence acquired by the direct use. In positive imbalance, for example, the emphasis shifts heavily toward alteration of the environment, but the culture is such that it successfully provides for the ignored direct-use factor.

The element of predictability in these hypotheses gives them genuine methodological utility, even if they may be proven simplicistic. They can be used experimentally in retrospectively or prospectively predicting the success or failure of a given society in preserving its culture form, or in achieving greater complexity. By virtue of the combination of the knowledge of culture type with the interactive state of negative imbalance, we can predict the eventual disappearance of the modern river people and their culture, since they can no longer adequately supply themselves with food. The modern Bottoms culture, also in negative imbalance, seems to be internally stabilized as far as a rationalized adjustment to urban alternative values goes. However, by studying the degree of negative imbalance, and relating this to economic problems, it becomes apparent that the Bottoms culture is precariously balanced and extremely susceptible to exterior economic fluctuations. It will certainly undergo severe alteration during the present war. In order to eat, Bottoms people will be forced to rely less on store foods and shift some of their one-sided reliance on cash crops towards self-subsistence; a process which will result in a shift away from negative imbalance towards the Hills type of positive imbalance. If they do make this shift, the culture will be altered.

In general, this viewpoint is most useful when confined to relatively small, self-contained societies, including in this term both so-called primitive societies and relatively inclusive modern rural societies. Problems are historically and institutionally too complex to solve by this simple method when we are confronted by the total urbanized society of which the present southern Illinois region is only a part, unless they are broken down into separate typological units.

Our final considerations relate to another of the central problems: the relation of difficult and favorable environments to culture.

The distinctive cases of concordance, like the Eskimo, seem to be extreme cases of positive balance, and not necessarily qualitatively different from the interactive states discussed in this paper. Kincaid, for example, has as high a "concordance" with riverbottoms environment as have the Eskimo with the Arctic.

It would seem that whereas extremely difficult environments produce distinctive cultures that may not be found elsewhere, hospitable environments offer a choice of features that cultures may accept or reject, depending upon

their historical development and socio-economic systems. Sometimes, as in the case of Middle Mississippi culture, there occurs a selection of one feature that produces high concordance and a distinctive culture. The process of interaction, positive balance, is no different in these cases of concordance in temperate climes than in the case of difficult environments.

This analysis may also be regarded as providing a conceptual orientation for the investigation of the cultural involvement of food habits. The problem of food supply is viewed as both cultural and environmental: the culture provides for its food in accordance with traditional methods, making use of some features of the environment and neglecting others. The environment furnishes food to the limit of its resources, providing the culture will make use of these resources. If the tradition is such that it requires foods not provided by nature, the culture either leaves the environment, remodels the environment (such as introducing corn agriculture), or perishes. The more homogeneous or developed folk-like the culture, the closer the functional relationship of subsistence economy to the environment.

It may be argued that since culture is a human phenomenon, it therefore has will, or volition, and is to be conceptually separated from environment, which is natural and non-volitional. This argument is valid if we wish to consider the problem from a cultural standpoint alone, which is of course the most immediately fruitful from a practical view. From an ecological viewpoint, however, it is necessary to reduce the two sets of phenomena to a common level since we are interested in their interaction.

In recent years ecological trends have become more prominent in anthropological research. The re-examination of cultural-environmental concordances has become the fashion, in an attempt to revise the over-simplified dogma developed by the historical school of ethnology in the 1920's. As this new interest becomes apparent, closer bonds to both ecology and sociology appear. It is hoped this paper may contribute to this growing re-alignment.

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THE MAGDALENIAN CULTURE IN POLAND[1]

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THE Early Magdalenian culture in Poland is essentially a development of Late Aurignacian, which continued to evolve throughout Solutrean times. Due to the fact that the true Solutrean never penetrated this area we find direct contact between Aurignacian and Magdalenian cultures. It is obvious, therefore, that there is a reoccurrence in the Magdalenian of the forms belonging to the Aurignacian Period. It is extremely difficult to distinguish between the developed Aurignacian and Magdalenian deposits because classical Magdalenian, with its cave art and harpoons, is not known in Poland; and, in addition, the stratification is clear only in the Maszycka cave site. Antoniewicz dates the remains mostly on the basis of bone and horn tools, especially spear points.

In Poland, as well as in Russia, the Early Magdalenian sites show monotonous uniformity.[2] They contain only a limited variety of forms in flint and bone. The technique is crude when compared with the preceding stage. At this point eastern European sites show a striking contrast to those in the rich Atlantic area. Art achievement in Poland at this stage is at a lower level of development than in contemporary Russian sites. It is limited to simple geometrical or zoomorphical designs; no clay modeling or painting is known. No human remains from this period have been found.

Early Magdalenian stations in Poland are uncommon, and important stations very rare. This stage is almost entirely confined to the southwestern region. The flora and fauna indicate arctic climate with tundra prevailing during the greater part of the Early Magdalenian, probably during the second maximum of the last glaciation. The bone remains from *Netoperzowa* include characteristic short bone javelin points, with sharp edged rounded ends and wide bevelled bases, long bone rods, oval in cross-section; bone awls, some ornamented by cuts; and needles of bone with flat pierced heads. The Jurassic flint tools include blade knives, scratchers, and notched scrapers. The flint implements in *Mammoth* cave are few and not at all diagnostic. They include scratchers, scrapers, and blade knives. Among the bone implements are javelin points with bevelled bases, ornamented with simple cuts and grooves; and also a flat rod of ivory pointed at both ends and grooved around the middle. Similar objects of ivory or bone have been found elsewhere in eastern European caves. Bird bones were probably used as ornaments, as was the rod of ivory. It is sug-

[1] For the discussion of earlier Paleolithic cultures in Poland see: S. Benet-Tygel, *The Paleolithic Period in Poland* (AMERICAN ANTHROPOLOGIST, Vol. 46, no. 3).

[2] P. P. Efimenko, *Perwobytnoe Obshchestwo.* (Leningrad, 1938); also E. Golomshtok, *The Old Stone Age in European Russia.* (Transactions of the American Philosophical Society, Philadelphia, 1938.)

gested that this was an ornament intended to be passed through a perforation in the septum of the nose or in the lobe of an ear.

Maszycka cave is the richest in early Magdalenian remains. It is situated on the left bank of the Prodnik River on the top of a hill about 150 m. above the level of the valley. The material was first published by Ossowski in 1883.[3] Rich cultural remains were found in a stratum of light yellow clay 1½ m. under the present floor of the cave. The fauna remains consist of *Elephas primigenius*, *Rhinocerus tichorhinus*, *Equus caballus*, *Hyaena spelaea*, *Ursus spelaeus*, *Ursus arctos*, *Bos priscus*, *Bos primigenius*, *Cervus alces*, *Cervies elephus*, *Antylope saiga*, and *Canis vulpes*. This is partly arctic and partly steppe and forest fauna, indicating the slowly rising temperature after the second maximum of Würm, from which the Netoperzowa cave dates. This was the beginning of the final retreat of the glacier northward from central Poland, during which the tundra gave way to the steppe and slowly developing forests.

Bone implements are very numerous, including javelin points made of animal ribs with single or double bevelled bases, and bone awls. Almost all of the points are ornamented by conventionalized zoomorphical designs or cross grooves grouped in the center or at the ends of the implements. Large spear points are made of mammoth tusks with the base often bevelled or split. There are thirteen spatulae of two types. Some are made of split, long bones and are convex; others are flat, about 1½ cm. thick, carefully polished, and have traces of limonite paint. There is one *baton de commândement*—a rare object in eastern Europe—with a pierced hole and one branch in the shape of a phallus.

Flint implements include about one hundred pieces, mostly blades. The blades are large and thick, about 6 to 8 cm. long; some are 11 to 12 cm. long with a thickness of 8 to 10 cm. A few blades are scarcely worked and some have only traces of trimming on the edges. Some have carefully trimmed edges with small, irregular retouching. There are end and corner scrapers, gravers with a middle point, one ordinary (*bec-de-flute*) graver, and a thin and delicate angle graver.

Koziarnia cave, near Ojcow, is somewhat later in time than Maszycka. Only a few tools were found here, a needle with a perforated round head, and three fragments of oval bone javelin points with bevelled bases.

Puchacz cave belongs at the very end of the Early Magdalenian Period. It is situated on the left bank of the Prodnik River. The cave is 16 m. long and has three entrances. It was first excavated by S. Czarnowski.[4] The upper level, 1½ to 50 cm. thick, was of gray earth mixed with rock boulders. Under it was

[3] G. Ossowski, *Sprawozdanie z badan jaskiniowych okolic Ojcowa w r. 1883* (Zbior Wiadomosci do Antropologji Krajowej t. VIII, 1884).

[4] S. Czarnowski, *Jaskinie i schroniska na gorze Smardzewskiej* (Pamietnik Fizjograficgny t. XVIII).

Map of the main Magdalenian sites in Poland.

a thick level of diluvial clay. The upper level contained numerous Neolithic tools and two fireplaces. Under it, on the border of the diluvial clay, was another great fireplace, apparently Magdalenian in age. There was a limited number of implements, thirteen made of Jurassic flint. There are gravers with a middle point on large, thick, wide blades. The twelve blade scrapers include end, double, and disc scrapers.

In contrast to the poverty and degeneration of the Early Magdalenian, we find in the next period a strong and influential culture which, in a compara-

tively short time, overran most of Poland and spread far beyond her borders.

During the time when the Middle and Upper Magdalenian flourished in western Europe, the Magdalenian hunters in Poland developed a distinctive sand-dune culture called Swiderian, from the type-site, Swidry Wielkie, near Warsaw, where it was found in its purest form and in stratigraphical position. The dunes developed during post-glacial times when the retreating water left huge concentrations of sand. Sawicki places the formation of the dunes in the interstadial period between the Kujavian-Mazurian and the Pomerian maximums which, according to him, corresponds to the Smidstrup Interstadial in Denmark. When the Vistula became established in its present course, after the last retreat of the glacier, wide areas of land became available for human settlement. Large groups of people moved from south Poland along the valley of the Vistula to the north. The Vistula was not only an important highway in the expansion of the Swiderian culture, but also a commercial route on which the excellent Upper Astarian flint was transported from the area of the Holy Cross Mountains to other distant localities.[5] As a rule Swiderian implements were manufactured from this raw material on the Middle Vistula and Upper Bug. In Poland, local industries of this culture developed with certain variations, especially in Volinia, Mazovia, and Polesie. However, these do not effect the essential homogeneity of the Swiderian culture over the whole area.

The name "Swiderian" is used freely by many archeologists to designate various flint industries, often local Epipaleolithic developments. The origin and formation of these will, however, become comprehensible by a consideration of its autochthonous territory in Poland. Therefore, it may be useful to give a short description of the main Swiderian sites together with a summary of the outstanding characteristics of the culture.

The realization of an existing stratigraphy in Polish sand dunes was first discovered by Sawicki.[6] A full profile of a sand dune was found by him in Swidry II-Gorki. It is composed of the following levels:

1. Recent wind-blown sand with laninae of humus.
2. Dark grey upper humus layer containing small charcoal fragments.
3. Pale yellow sand containing charcoal.
4. Lower humus layer.
5. Ancient wind-blown sand.
6. Sand and gravel of the highest accumulative terrace of Pravistula.

The preceding stratigraphy is not completely or chronologically represented in every sand dune.

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[5] W. Antoniewicz, *Archeologja Polski* (Warszawa, 1928).

[6] L. Sawicki, *O metodzie badan stanowisk otwartych wydmowych* (Wiadomosci Archeologiczne vi, 1921).

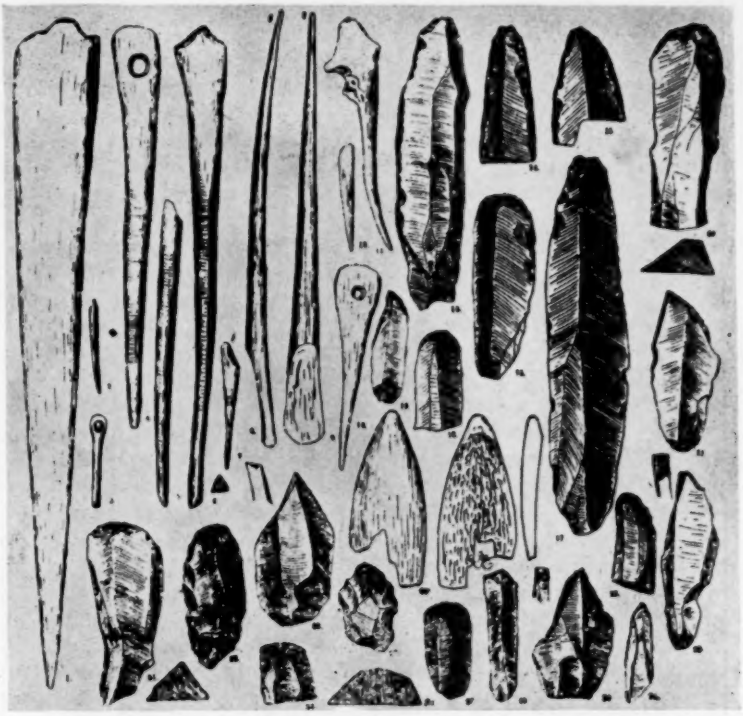

PLATE 1. Magdalenian culture (After L. Kozlowski).
1–12 Netoperzowa cave.
13–24 Maszycka cave.
25–34 Puhacz cave.

The appearance of humus, as in recent times, depended upon the local conditions, such as the presence and the level of soil water. But the presence or absence of the lower humus layer, which overlies the Swiderian culture, is considered by Sawicki to be of basic importance. The age of Swiderian is difficult to establish. The sand dunes have not preserved evidence of fauna or flora, therefore the only means of dating is geological and cultural stratigraphy. Sawicki was also the first to establish the stratigraphical distribution of chronologically different cultural strata in the open dune sites. On the basis of his observations of Swidry Wielkie I and Osiek, he states that the Sidwerian cultural stratum consistently appears in the lower level of the dunes under the

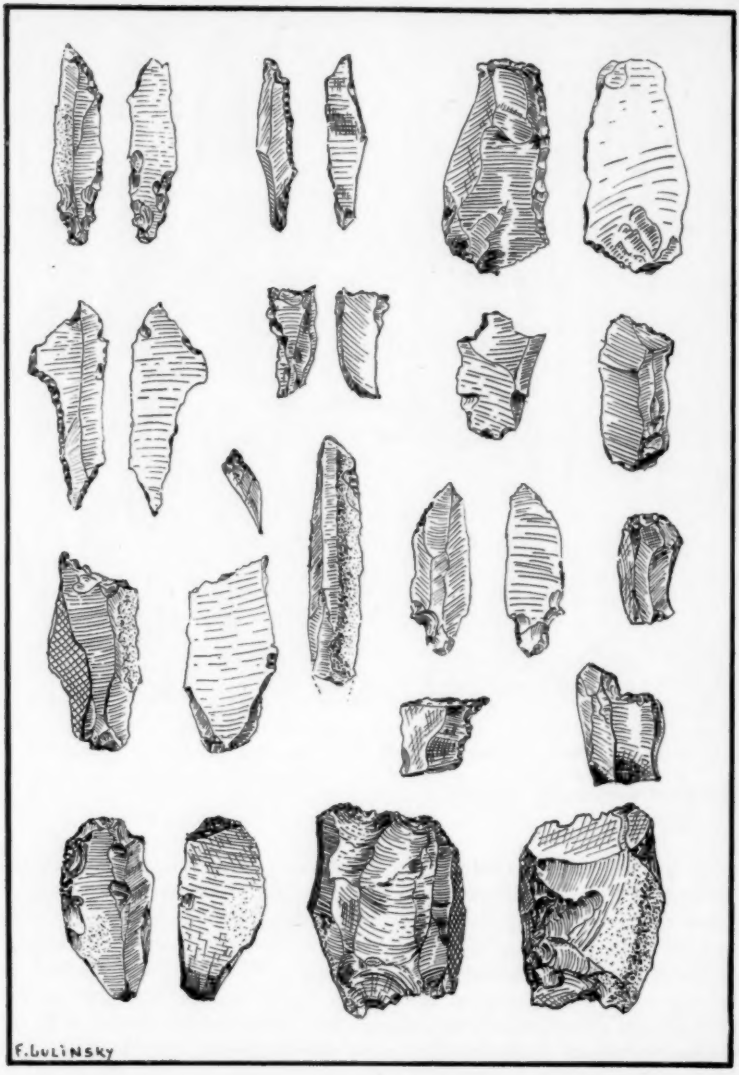

PLATE 2. Flint industry of Swiderian period in Poland. Nowy Mlyn site.

lower humus layer. Sawicki concludes, from this fact, that the people with Swiderian culture inhabited the dune area during the time that the dunes were forming. Above the Older Swiderian are "nests" of Younger Swiderian.

The upper stratum of the lower dune sands usually contains Early, Middle, and Late Epi-Paleolithic industries: Azylian with elements of Swiderian culture, Early and Middle Tardenoisian, and occasionally Upper Tardenoisian. Recently the local winds have removed portions of the dunes, and on the exposed surface remains from different times appear side by side, which has often confused archeologists.

The Swiderian industry includes elements older than those found in the Magdalenian, since the roots of the culture reach deep into the Aurignacian. Because material remains were all located in the sand dunes, only flint implements have survived. The leading tool type is a tanged arrowhead (Sawicki's "Swiderian blade"), a clear derivation from the Aurignacian-Solutrean slim blade. The bulb of percussion is entirely removed and the tang is covered with flat, inverse retouch, typical of the Solutrean technique of the Netoperzowa, Kostenki I, Berdyzh and Gagarino sites. This type represents the autochthonic cultural element which is connected with the eastern European center of the Upper Paleolithic Period. The blades are long and narrow, often in the form of a willow leaf. They were skilfully struck off from slim, one- or two-base cores. The tang may be symmetrical or asymmetrical with a pointed or wide base. Many are tanged knife-like blades which resemble the Late Aurignacian blades of Font-Robert type. The trimming on this type of blade is sometimes confined to pressure flaking down one side. Gravers, ordinary (*bec-de-flute*) and cuneiform, are very characteristic of Swiderian industry. The Lower Paleolithic double scraper still occurs, but variations of the more or less short scraper are typical. Nuclei are very common. There is evidence that in many cases they were used as implements. Some represent typical forms of the Aurignacian and Magdalenian of Poland. Two types are most prevalent: 1) a club-like nucleus with two striking platforms, 2) a flat, wide nucleus with a narrow striking platform. In the latter the lower face is flat, the upper convex, covered partly with negative trimming. This second type, according to Sawicki, is a prototype of the flat Epi-Paleolithic and Neolithic nuclei, also found in Polish Epi-Paleolithic dunes.

The Swiderian people made a special effort to use only the best varieties of Upper Astarian flint for their tools, even when other flint was at hand. The rudiments of trade probably existed among the Swiderian hunters since Upper Astarian flint was transported by them or to them from the Holy Cross Mountains. Apparently this material was considered of great value since in various sites, especially in the pure Swiderian caches of flint, it was often found in topographically isolated places.[7] In sand dunes along the Vistula workshops

[7] L. Sawicki, *Przemysl Swiderski I.* (Przeglad Archeologiczny V, 1933–1934).

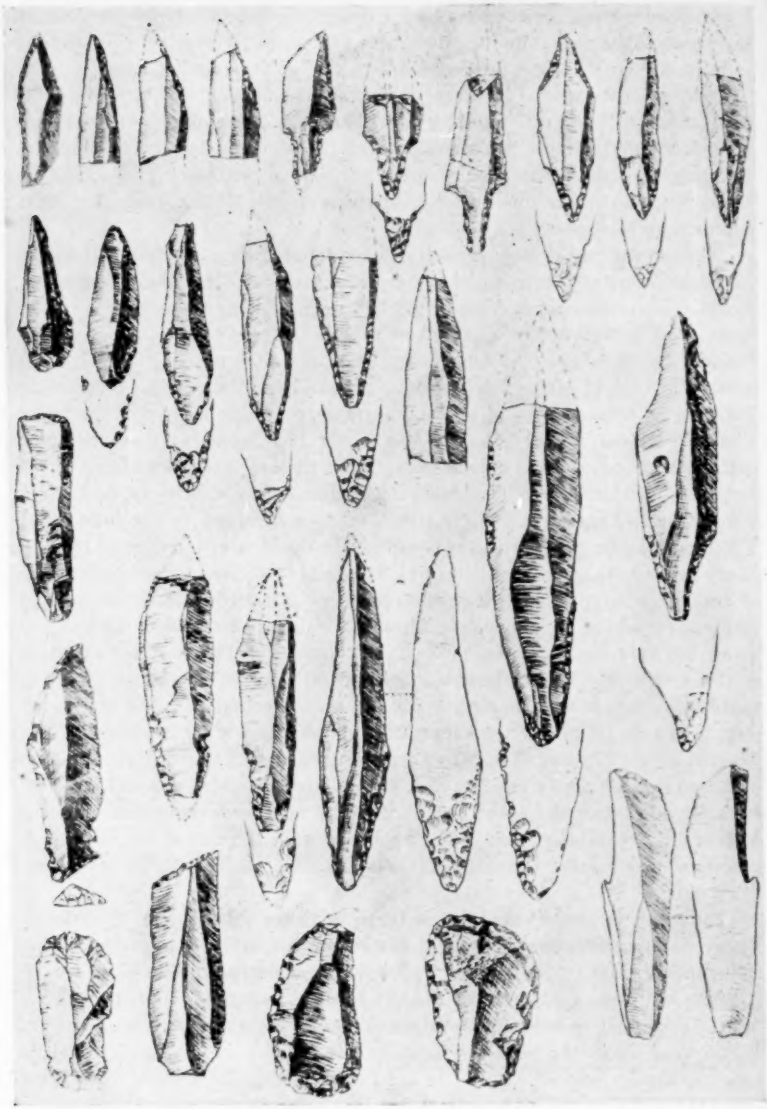

PLATE 3. Swiderian flint industry from Borek Falecki site (after Boleslaw Czapkiewicz).

with many cores and discards, half completed objects and spoiled tools, were discovered. It is interesting to note that these shops have very few finished tools. Some of the shops are poor in content, some rich, but the type of product is the same. From the fact that most of the Swiderian shops, known from Mazovie, are near rivers, Krukowski concludes that the flint was transported by water.[8]

While the material has not been systematized, a survey of the existing literature shows three stages of development in the Swiderian culture which I will refer to as Early, Developed and Late. The way in which the sites are designated in the Polish literature is somewhat confusing. Below I have correlated my proposed stages with those of Sawicki. In many cases the Polish material has been discussed without reference to the age of the sites so that I have been forced to chronologize this material on the basis of typology alone.

Sawicki	*Proposed remaining*
"Sites older than Swiderian I"	Early Swiderian
Swiderian I	Developed Swiderian
Swiderian II	Late Swiderian

Another stage, called Swiderian III, which appears in the Early Epi-Paleolithic is not discussed here as we are dealing in this paper with Paleolithic industries only.

EARLY SWIDERIAN

Early Swiderian is characterized by the crude beginnings of the Swiderian blade. The tang is only slightly defined and often not trimmed on the base. There are numerous blades of gravette type present and also notched scrapers. As a result of Sawicki's researches in the northeastern part of the Holy Cross Mountain region, during 1921–1928, a number of sites, which Sawicki considers older than Swiderian I, came to light. It has already been mentioned that this area contains rich deposits of excellent Upper Astarian flint, which was used by the Swiderian hunters and imported by them to different parts of the country. The oldest of these sites, *Nowy Mlyn*, northwest of the city Skarzysko, is of definitely local character. The basic element here is the autochthonious Aurignacian-Solutrean tanged blade which is the prototype of the Swiderian blade. Also present are gravette-like blades, notched scrapers and long scrapers, gravers of Pre-Magdalenian shape, borers and a few blades of Predmost type.

Other sites in this region show relationship both to the Nowy Mlyn industry and to the Swidry I site which belongs to the Developed Swiderian period.

[8] S. Krukowski, *Exploitation, transport et commerce de silex dans le holocene de la Pologne. Conclusions sur les qualites du silex cru et de ses instruments.* (Wiadomosci Archeologiczne, 1922, Partie II).

In the neighborhood of Krakow in the *Skotniki*, *Tyniec*, *Skrawin*, *Sciejowce*, *Razczna*, and *Przeginia Narodowa* sites, Boleslaw Czapkiewicz found early Swiderian blades in the lower level of the sand dunes. They were associated with slim blades of willow leaf shape.

The *Kobierzyn* site near Krakow contains pure Swiderian culture elements.[9] Among a few hundred long, thin blades, are many wide blades and discards, often with a part of the core surface left. Arrowpoints of long narrow blades, covered at the base point with Solutrean surface retouch, are shaped like leaf blades of the Font-Robert type. Many of the scrapers are made on wide, short blades. There are also cuneiform and angle gravers. The Swiderian culture is mixed with Tardenoisian and Neolithic elements in the neighboring dune, *Borek Falecki*. Among the fifty tools found in this dune site were long-narrow blades and willow leaf arrowheads made of Jurassic flint. The arrowheads have Solutrean surface retouch on the lower part. There is one gravette type arrowhead. The remainder of the tools consist of a number of knives on narrow blades with partly trimmed back, the upper end being cut off obliquely and blunted; two knives on thick blades resembling the Châtelperon type; some angle gravers; and nuclei which have two striking platforms and show negatives of narrow blades and flakes. In the *Zakrzow* site in the Wielicki district, the same leading types appear as in Borek, but the accompanying forms are different: long scrapers on blades with the working end trimmed in bow form, double scrapers, and cuneiform and angle gravers. One *point à cran* was found a few meters from this site. The notch on this point takes up about two thirds of the blade. The size of the implements are smaller than those in Borek. With the expansion of the Swiderian hunters to the north another center of this culture developed in the lowland of Poland. This is the Developed Swiderian period. It is characterized by several types of tanged blades. The Aurignacian-Solutrean influences still prevail.

DEVELOPED SWIDERIAN

In the *Melnik* site at Podlasie[10] distinct Aurignacian analogies are seen by Szmit. As in the case in the Kozarowka and Stankiewicze sites the leading type in Podalsie are scrapers, gravers, and arrowheads of the Font-Robert type. Drills and blunted back blades are few. The majority of the tools are nuclei and flakes. Szmit divides the nuclei into three groups: flaked nuclei, bladed nuclei, and nuclei from which both flakes and blades were struck off. Blade

[9] Boleslaw Czapkiewicz, *Slady przemyslu swiderskiego na stanowiskach wydmowych w okolicy Krakowa* (Wiadomosci Archeologiczne XIV).

[10] Zygmunt Szmit, *Recherches des colonisations de L'Epoque de Pierre en Podlasie* (Wiadomosci Archeologiczne X, Warszawa, 1929). Szmit has avoided analyzing this site with chronological exactness. He only points out its similarities with the Aurignacian.

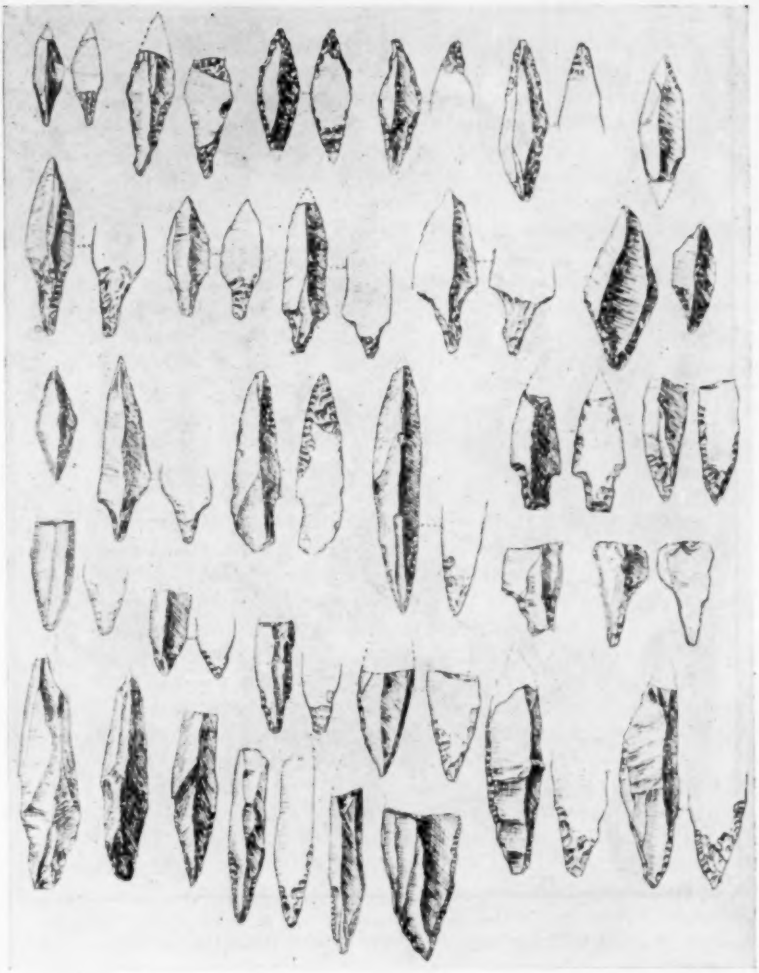

PLATE 4. Swiderian industry from Zakrzów site (after Boleslaw Czapkiewicz).

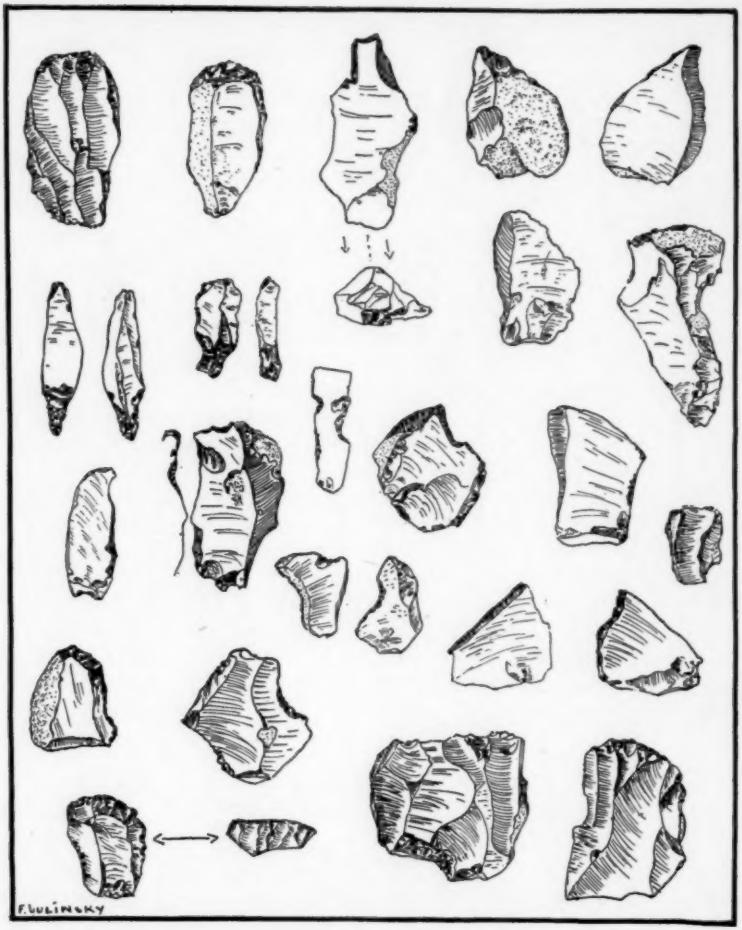

PLATE 5. Flint industry of Swiderian period in Poland (Melnik site).

scrapers are very numerous. Some have small notches and fine trimming along the edges. Some of the long scrapers have bow-like edges. There are variations on the short and flake scrapers; they have slant-like, S-like, or pointed blades. There are a few double scrapers. Almost all the Melnik scrapers are known in

the Aurignacian culture. Melnik gravers are made of thick blades and flakes. The largest group comprises angle gravers which often have wide, coarse trimming. There are only a few cuneiform, beaked or double gravers. All these gravers are much larger and heavier than those known from other dune sites. The Melnik gravers have analogies in some western and middle European sites with Solutrean influence. However, the Melnik culture seems to have a distinct character. There are also large amorphic tools made of both nuclei and flakes. Szmit also sees an analogy to Melnik in the Aurignacian level of Mammoth cave. The similarity is considerable, especially with regard to scrapers and gravers. Szmit also refers to some Russian sites as showing similarity to Melnik.

Szmit has well established by his researches the expansion of Swiderian to Podlasie. During his five years of excavation in the dunes on the right bank of the Bug River between Brzesc and Drohiczyn, he discovered approximately half a hundred sites. In many of these sites there was only one humus layer containing prehistoric remains. Szmit distinguishes two groups of sites in Podlasie. The older group is situated on the outskirts of the head morain of the Podlasie stadium and includes the Melnik, Klodno, Szumaki, and Dobroniez sites. The younger group is situated more to the north on the area of the bottom morain of the Polasie stadium. It includes Stankiewicze, Mackowicze, Turnia Wielka, Zajaczniki and Koziarowka. The older group may be regarded on a typological basis as Developed Swiderian while the younger group which has Epi-Paleolithic elements belongs to Late Swiderian.

The older group, in which Melnik, discussed above, is the main site, Szmit differentiates from the younger group by the following characteristics: the relatively few varieties of imported flint; nuclei prepared for blades and flakes; an absence of small nuclei of Tardenoisian type; the presence of a great number of large flakes from which tools were prepared; numerous gravers of *busques* type, and large amorphic tools made of thick flakes; larger implements on the whole.

Swidry Wielkie I is another local center of the Developed Swiderian period. The inhabitants of this site used Upper Astarian flint almost exclusively for their tools. Tanged blades, which constitute the largest tool group, are the most characteristic type for Swidry Wielkie I. In spite of their apparent uniformity Sawicki distinguishes three separate types among them: 1) the tanged blade derived from the Protosolutrean slim blade—"the Swiderian blade"—which represents the leading type; 2) the tanged blade which shows a close relationship to the Grimaldi type gravette; 3) a type that resembles the Late Aurignacian *point à cran*. A few thousand blades were found in this site. Typical blades reach 9 cm. in length and 18–21 mm. in width. About thirty nuclei represent forms known from Aurignacian and Magdalenian cultures. They are almost exclusively cylindrical with two striking platforms. Their size is from

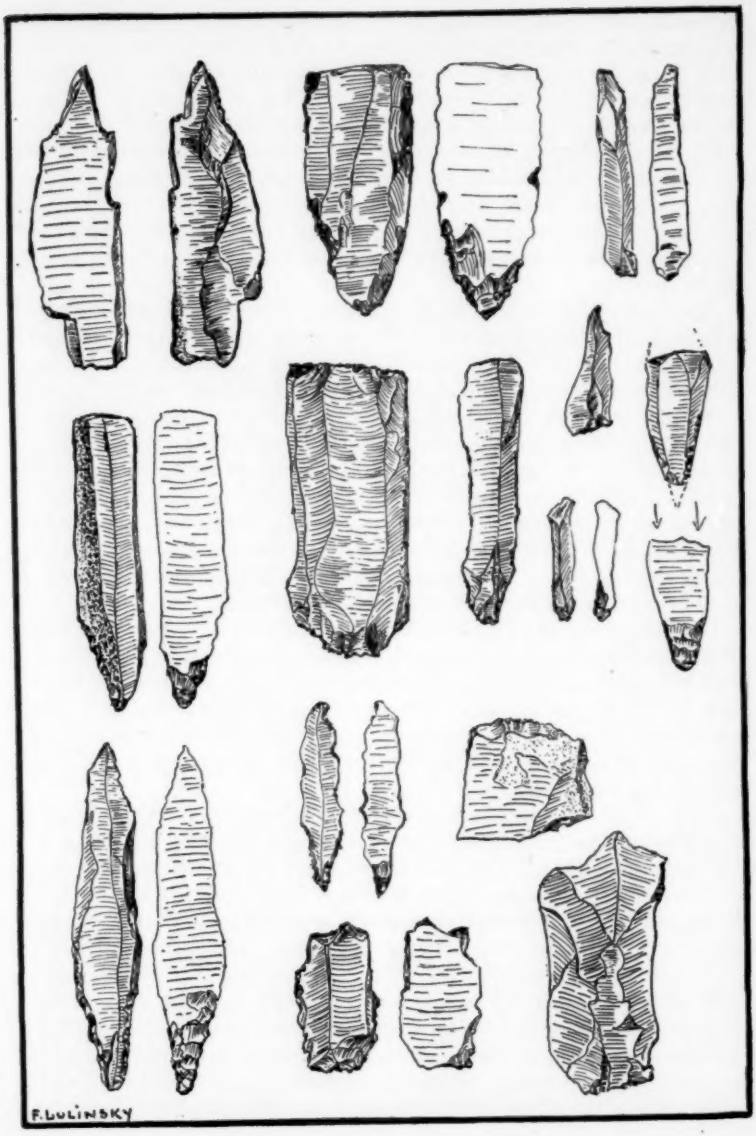

PLATE 6. Flint industry of Swiderian period in Poland (Swidry site).

10 cm. to 5.5 cm. The nuclei show great use and probably were employed for many activities. Gravers also constitute a large group. Most common are angle gravers of different types and cuneiform gravers. Blade scrapers and piercing implements are also present. The typology of the gravers as well as the blade scrapers is partly Upper Aurignacian and partly Magdalenian according to Sawicki.

LATE SWIDERIAN

Swidry Wielkie II is a direct development from Swidry I and is found overlying the latter. In Swidry II as compared to Swidry I there are more of the tanged blades of "Swiderian blade" type. In this period there appeared a typical blade with blunted back. There is a scarcity of angle gravers but a few types of cuneiform gravers have appeared. There is also a large group of short scrapers similar to the Azilian and Azalian-Tardenoisian types.

The Chwalibogowice industry consists almost entirely of tanged blades with a blunt back. Some of the blades resemble tools from the Swidry II site. The back of the blade may be straight, oblique, bow-like or notched like the Aurignacian *à cran*. Some blades are half way between Chwalibogowice and Swidry II in type. Besides tanged blades there are also drills, scrapers, and oval scrapers on large flakes. Sawicki regards the Chwaligobowice industry as a special local development, contemporary with Swidry I, marked by a strong Grimaldi infiltration which may be connected with a new wave of Grimaldi cultural expansion.

The Czerwony Borek site had exclusively implements made of thin, long blades of Upper Astarian and Baltic flint. The leading types are: scrapers, gravers, arrowheads of Font-Robert type, and knives with backs blunted half way. Drills and blades chipped along the edge are rare. Almost all blade scrapers are thin and symmetrical. The edges have a delicate surface retouch extending only a short way on to the blade. The scrapers differ from Chwalibogowician, but rather resemble Neolithic ones; however, triangular and angle gravers are similar to Chwalibogowician. The arrowpoints, of Font-Robert type, are covered, at the base and at the point, with surface retouch. It can be said that, on the whole, the Czerwony Borek flint industry is only different in detail from the Chwalibogowician industry.[11]

The *Stankiewicze* site, the richest and most typical in the bottom moraine area of the Podlasian stadium, contained considerable material. Szmit regards the Stankiewicze site as of a later and more developed stage than Melnik, which is situated on the outskirts of this moraine. The Stankiewicze people used Upper Astarian and local flint. The nuclei show negatives of both flakes and blades, while special nuclei prepared for flaking only, are lacking as in the

[11] Zygmunt Szmit, *Recherches des colonisations de l'epoque de pierre en Podlasie* (Wiadomosci Archeologiczne X, p. 49, Warszawa, 1929).

Melnik site. Short scrapers are the most prevalent but other forms, such as double, round, and oval scrapers are numerous. There is no trimming on the side edges of these tools. Single, and double gravers, also angle and cuneiform blade and flake gravers are common. The willow leaf blade is almost absent. Font-Robert type arrowpoints are more numerous here and the size of this instrument is much smaller than in the Melnik site. A large percentage of the instruments of Stankiewicze show the beginning of Tardenoisian influence. Szmit considers the possibility of the Podlasie Tardenoisian already existing in the locality of the Stankiewicze industry, for degenerated forms of notched points and scrapers appear in several of the sites.

The material in the few *Turnia Wielka* sites is not basically different from that of the flint industry of Stankiewicze. Turnia Wielka has more delicate implements that often resemble Tardenoisian types. *Zajeczniki* has still more of the Tardenoisian elements. The scrapers are short and the gravers resemble these from Stankiewicze. *Koziarowka* has a great number of nuclei. Almost all of the implements are made of blades. They include symmetrical scrapers and angle and cuneiform gravers. During Sawicki's researches in Polesie he discovered a new Late Paleolithic industry represented by *Lubikowicze* and *Marjanowka*. This industry cannot be compared with any of the known industries from the lowland center. Other sporadic finds also indicate the existence of another local Late Paleolithic culture distinct from the Swiderian but including tanged blades of Late Swiderian type. Numerous gravers and scrapers on blades are also present.

Late Swiderian closes the Upper Paleolithic Period in Poland. The next step in the evolution of this industry is Early Epi-Paleolithic Swiderian. In this later industry the tanged blade has been gradually superseded by microlithic blunt blades geometrical in shape.

AGE AND DISTRIBUTION OF SWIDERIAN CULTURE

The exact age of Swiderian culture is not yet established. There is, however, abundant evidence that points to a long development with local differentiations. The very beginning of Swiderian culture was probably contemporaneous with the closing stages of the Late Aurignacian in the west. In the last stages Swiderian came in contact with the Azilian industry. The intermingling which followed this contact resulted in the development of new tool types.

It is not yet possible to estimate the exact distribution of Swiderian culture. In addition to the Holy Cross Mountain center, this industry appears in closely associated centers in the valleys of the Vistula and its tributaries, reaching in the north to Warsaw where it developed into the lowland center, Swiderian I. There is no evidence that hunters with Developed Swiderian cul-

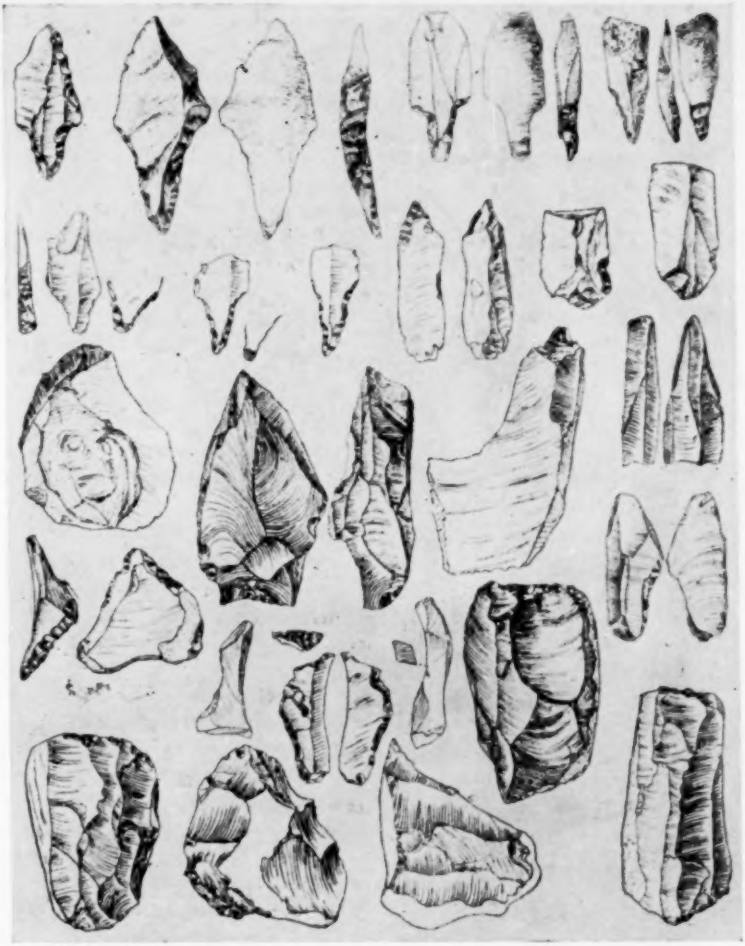

PLATE 7. Swiderian flint industry from Stankowicze site (after Zygmunt Szmit).

ture ever crossed the border of the Baltic glaciation. The Swiderian settlement found at Podgorz, near Torun in Pomerania, belongs to the late period. It includes only a few objects: tanged arrowheads, single-shouldered points, a blade

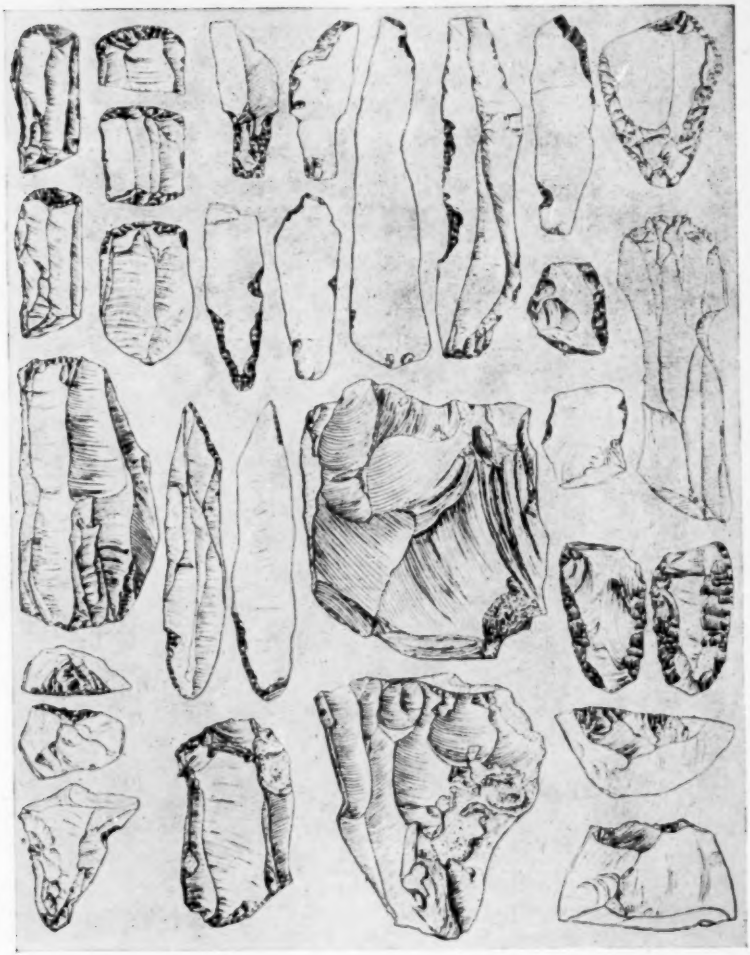

PLATE 8. Swiderian industry from Koziarówka site (after Zygmunt Szmit).

with oblique trimmed point, and untrimmed blades and flakes. The province of Wilno, northeast of Warsaw, developed a local Late Swiderian industry.[12]

[12] Włodzimierz Antoniewicz, *Czasy przedhistoryczne i wczesnodziejowe ziemi Wileńskiej* (Wilno 1930).

The finds were made in the districts of Lida, Troki, and Oszmiany. The tools are made of local chalk flint. The main types are blade knives with trimmed back, end scrapers, double scrapers and arrowpoints.

Only industries related to Late Swiderian and Epi-Paleolithic Swiderian are known in Polesia, Volynia, and western Ukraine.[13] According to G. Bonch-Osmolowski numerous sites indicate the expansion of the Swiderian culture to Central Russia, western Ukraine, and the Crimea, where Swiderian tanged implements appear in various contemporary and later sites.

In Jelina (a sand dune site in the Oka valley, Muromski district) Sawicki discovered several tools made of Upper Astarian flint, which represents an import from Poland. In Russia this variety of flint is not known, and the nearest deposits of it are in the northern Holy Cross Mountains. Among the tools discovered at Jelina were *points à cran* of a type frequently found in Polish dune sites of bastard Swiderian.[14]

Sawicki states that the Swiderian culture in its expansion to the west did not cross Silesia and Brandenburgia. He considers this area as a border line of two separate cultural provinces: the *northwest European*, which embraces Belgium, Holland, northwest Germany, Denmark and Norway; and the *middle east European*, which embraces Silesia, Brandenburgia, Poland, Lithuania, White Russia, Central Russia, Ukraine, and the Crimea. A special local industry, characterized by geometrical Late Magdalenian forms, developed in a part of the first province (Belgium, Holland and northwest Germany). The center of the second province is the Nowy Mlyn site in Poland.

CONCLUSIONS

In summarizing the stone age in Poland, we may say there are three elements present: individuality, which is expressed in local developments; continuity of these local forms; and a certain backwardness in comparison to both eastern and western centers due to Poland's peripheral position.

Due to the climatic conditions only the southern part of Poland was inhabited during Lower and Middle Paleolithic times. These earliest inhabitants did not live in large congregations but settled in small isolated groups. There is no evidence of any interrelation between these groups. On the contrary the individuality and the archaic forms of the industry they produced indicates otherwise. The first carriers of Late Acheulian culture probably came to Poland from the southwest; and at this period certain parallels with western Europe can be found. The Mousterian industry here was an outgrowth of local Late Acheulian forms. The contact with the east was probably first established at this period since we find definite parallels in contemporaneous Russian sites.

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[13] L. Sawicki, *Przemysl Swiderski I* (Przeglad Archeologiczny V, 1933–1934).

[14] Ludwik Sawicki, *Materjaly do znajomosci prehistorji Rosji* (Przeglad Archeologiczny III, 1925–1927), p. 172.

The contact with the east became still stronger during the Aurignacian Period. The author disagrees with Sawicki in regard to the western origin of the Aurignacian culture in Poland. The apparent similarity of Russian and Polish site material in typology and conditions in which it was found, and the great concentration of Aurignacian sites along the Dniestr in Podolia and Bessarabia indicate quite clearly the route which Aurignacian hunters took when approaching Poland. There was also an infiltration of influences from Moravia to the south, but these influences come relatively late and were expressed mostly in Solutrean technique.

The Magdalenian culture in Poland seems to occupy a special place. The Lower Magdalenian shows backwardness in comparison with that of both the western and eastern areas by its complete lack of art and limited forms of flint tools. The Middle and Upper Magdalenian in Poland witnessed a great development of the autochthonous Polish Swiderian culture which was a direct outgrowth of the Solutrean-Aurignacian culture. A comparison of the Swiderian sites leads us to the conclusion that during this epoch there were numerous local variations of this culture.

Poland lies on the boundary of two cultural worlds, the eastern and the western, on land occupying the exact geographical center of Europe. This geographic situation makes her a natural bridge between the Baltic and the Black Sea, as well as a highway between the west and east of Europe. From the earliest Paleolithic, through practically all the prehistoric epochs, Poland formed the crossroad of countless wanderings and settlements. The conflicts and fusions on her territory resulted, as we have seen, in a considerable number of distinct cultures that appeared side by side and in various combinations within her borders.

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BIBLIOGRAPHY

Antoniewicz, Wlodzimierz. Archeologja Polski. Warszawa, 1928. Czasy przedhistoryczne ziemi Wilenskiej. Wilno, 1930.

Bryk, J. Kultury epoki kamiennej na wydmach zachodniej czesci poludniowego Wolynia. Archiwum Towarzystwa Naukowego we Lwowie Lemberg, 1928, vol. V.

Czapkiewicz, Boleslaw. Slady przemyslu swiderskiego na stanowiskach wydmowych w okolicy Krakowa. Wiadomosci Archeololiczne XIV, 1936.

Czarnowski. Paleolit na gorze Smardzewskiej. Kosmos, Lemberg, 1906.

Klimaszewski, Mieczyslaw. O kilku problemach glacjalnych w Polsce. Rocznik Polskiego Towarzystwa Geologicznego v. VIII, 1932.

——, Podzialy okresu diluwialnego Europy i polnocnej Ameryki. Wiadomosci Geograficzne, 1936.

Kostrzewski, Jozef. The prehistory of Polish Pomerania. Torun, 1936.

Kozlowska, A. Z badan nad flora paleolitu w Polsce. Kosmos, 1921.

Kozlowski, Leon. Die altere Steizeit in Polen. Die Eiszeit, v. I, Leipzig, 1924.

Krukowski, Stefan. Znaczenie stref recesywnych ostatniego zlodowacenia Polski dla znajomosci najstarszych pionerow cywilizacji. Wiadomosci Archeologiczne t. VII, 1922.

——, Stanowisko gornosolutrejskie z konca nastepowania ostatniego zlodowacenia w Polsce. Sprawozdania Instytutu Geologicznego v. 1, Warszawa, 1922.

——, Pierwociny krzemieniarskie gornictwa transportu i handlu. Wiadomosci Archeologiczne v. VII, 1922.

——, O wieku wydm Nizu Polskiego. Posiedzenie Naukowe Panstwowego Instytutu Geologicznego, 1922.

Lewinski. Dyluwium w Polsce i Danji. Rocznik Polskiego Towarzystwa Geologicznego, Krakow, 1930.

Polanskyj, J., i Krukowski, S. Die erste Paläolithstation in Nowosiolka-Kostiukowa (Podolien). Zbirnik mat-przyr. lik. sekcji Nauk. Tow. Szewczenki, Lemberg, 1926.

Premik. Do znajomosci dyluwium w polud. wsch. Wielkopolsce. Polskie Towarzystwo Geograficzne VIII, Krakow, 1932.

Sawicki, Ludwik. Wydmy, jako srodowiska wystepowania zabytkow kulturowych. Wiadomosci Archeologiczne v. VII, 1922.

——, Grota Nietoperzowa w Jerzmanowicach. Przeglad Archeologiczny v. III, 1926.

——, Materjaly do znajomosci prehistorji Rosji. Przeglad Archeologiczny v. III, 1927.

——, L'âge de l'industrie swiderienne a la lumiere de la geomorphologie de la pre-Vistule aux environs de Varsovie. Bibljoteka prehistoryczna v. I, Poznan, 1930.

——, Przemysl Swiderski I stanowiska wydmowego Swidry Wielkie. Przeglad Archeologiczny, 1933.

Szafer, Wl. Zarys stratygrafji polskiego dyluwjum na podstawie florystycznej. Rocznik Polskiego Towarzystwa Geologicznego v. V, 1928.

Szafer and Jaron. Pleistocenskie jezioro pod Jaslem. Polska Akademja Umiejetnosci Starunia 8, Krakow, 1933.

Szmit, Z. Badania osadnictwa epoki kamiennej na Podlasiu. Wiadomosci Archeologiczne X, 1929.

THE ORIGIN OF CORN: AN EVALUATION OF FACT AND THEORY[1]

By ALFRED F. WHITING

ANTHROPOLOGISTS, seeking an answer to their own historical problems have asked the botanists "What is the origin of corn agriculture?" This problem, however, is not subject to pure botanical analysis unaided by anthropology. It is the purpose of this article (I) to examine the reason for the anthropological faith in a simple botanical solution of this problem, (II) to review briefly some of the current theoretical positions, and (III) to evaluate some of the hypotheses by which these problems are now being examined by botanists with particular regard to the bearing of anthropological theory upon those hypotheses.

I. THE MYTH OF TEOSINTE

One reason why anthropologists seem to feel that the question of the origin of corn[2] is subject to an adequate botanical solution may be found in the history of this problem. Shortly before the turn of the century a plant was collected in central Mexico which appeared to be the wild ancestor of modern corn.[3] Thus the problem of where corn agriculture originated was apparently satisfactorily solved.

Subsequent work showed that the supposed ancestor was not a wild corn but a hybrid resulting from the interbreeding of cultivated corn and the wild grass, teosinte (*Euchlaena* sp.).[4] For a while it was thought that this indicated that corn was domesticated teosinte,[5] but this theory was essentially a makeshift solution and was not based upon very sound evidence.[6]

In 1912, Collins[7] distinctly showed that corn could not have been derived from teosinte alone, and postulated that some unknown corn-like plant which had been previously domesticated outside the range of teosinte had been brought into the area where teosinte was growing and there accidentally interbred with this wild grass to produce our modern corn. As long as one is concerned with the *origin* of American agriculture, it is of little significance that corn, once domesticated, was subsequently improved by interbreeding with another grass in a different area.

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[1] The author is deeply indebted to Dr. Paul Weatherwax and to various members of the Department of Anthropology of the University of Chicago who have read, criticized and disagreed with this paper at various times in its evolution from a master's thesis to its present form. Likewise he wishes to thank Dr. Alfonso Caso, without whose encouragement this discussion might never have been published.

[2] The term "maize" is sometimes confused with "milo-maize," a form of sorghum. Furthermore "maize" cannot be used in many expressions in American English (e.g. Maize-cob pipe). The writer therefore prefers to use the term "corn" to refer to Indian corn, *Zea Mays*.

[3] Harshberger, 1893. [4] Harshberger, 1896. [5] Harshberger, 1896, 1907.

[6] Based upon the proposition that interfertility was a better criterion of relationship than comparative morphology, a position now definitely discarded as obviously invalid. [7] Collins, 1912.

Both the original analysis of the problem[8] and the subsequent reinterpretations are difficult for the non-specialist to follow. It is not surprising therefore that men like Spinden,[9] Wissler,[10] Kroeber,[11] Lowie,[12] Thompson,[13] and Cole[14] to mention only a few, failed to understand the botanists' conclusions.[15] Kidder,[16] though recognizing that the botanical evidence was not clear, continues to assume that the problem is subject only to botanical solution. Recently the publications of Vavilov, Kempton, Weatherwax, and Mangelsdorf have aroused the anthropologists' interest. In spite of obvious inconsistencies the belief continues among anthropologists that the problem is subject to a conclusive botanical analysis.

In the absence of a convincing wild ancestral form or an extensive archeological record, the problem of the origin of a cultivated plant becomes an exceedingly difficult one.[17] Any solution must rest upon a series of generalizations of a very high order of abstraction. These generalizations are constantly being modified with new discoveries and new developments.[18] In brief it is highly questionable if any solution to such a problem as this, involving as it does the determination of the distribution of an unknown species at an unknown time in the past, can be reached on the basis of the information now available.

II. CURRENT THEORETICAL POSITIONS

Weatherwax. Weatherwax, basing his analysis upon comparative morphology, has suggested that corn, teosinte, and Tripsacum have been derived from a single common ancestor during the course of natural evolution.[19] Modern corn, he says, is the domesticated form of a wild plant which is either extinct or as yet unknown. In contrast to Collins, Kempton, and Mangelsdorf, he finds nothing in modern corn which necessitates the postulation of intermixture in recent times with teosinte or Tripsacum.

Some intermixture apparently has taken place, perhaps in recent times,[20] but the extent and significance of this intermixture has not been satisfactorily

[8] Harshberger, 1893, does not make clear that his "wild corn" is the *Zea canina* of Watson, though he lists this as a synonym. [9] Spinden, 1915, 1928, p. 52.

[10] Wissler, 1922, p. 23. [11] Kroeber, 1923, p. 353. [12] Lowie, 1938, p. 295.

[13] Thompson, 1936. [14] Cole and Cole, 1938, P. 158.

[15] Wissler's statement (1922, p. 23) that the investigations of Harshberger and Collins indicate that corn came from a grass of the Maya habitat is doubly in error. He quotes Harshberger's 1893 paper in which teosinte is not considered to be the ancestral form, and Collins, who held the position that the original domestication took place outside the range of teosinte. In neither reference is there any suggestion that the wild ancestor grew in the Maya area.

[16] Kidder, 1936, p. 149. [17] de Candole, 1892, pp. 12–15.

[18] For criticism of these methods in botany see Ames, 1939, pp. 120 ff., and in anthropology, Linton, 1936, pp. 377 ff. [19] Weatherwax, 1935, 1936.

[20] Note particularly the peculiar forms of Chromosome X in certain Southwestern corn varieties and in teosinte. (Longley, 1938, p. 194) and the appearance of certain corn-like characters in Tripsacum. (Cutler, quoted by Mangelsdorf and Cameron, 1942, p. 252.)

established. Weatherwax, more than any other single writer has contributed a great deal of sound thinking to this problem. Many of his contributions are of a highly technical nature and, since they deal with problems now apparently satisfactorily solved, we need not discuss them here.

Mangelsdorf. Mangelsdorf and Reeves have presented an elaborate series of hypotheses.[21] The basic assumption that underlies all of these is that a wild corn without knobs[22] on its chromosomes was native to the lowlands of Paraguay and Bolivia and was first cultivated there. Subsequently this domesticated form was highly developed in Peru. This assumption appears to rest upon very inadequate data. Their further hypotheses, that domesticated knobless corn crossed with knob-bearing Tripsacum to produce teosinte and the knobbed forms of corn, seems unnecessarily complex and is inconsistent with the published data upon chromosome morphology.

The argument is as follows: On the basis of breeding experiments Mangelsdorf and Reeves appear to have established that teosinte differs from corn in four groups of characteristics. These characteristics they find to be the expression of four clusters of genes on three of the teosinte chromosomes. In as much as these characters resemble Tripsacum, it would appear that if these particular four sections of the chromosomes were replaced in corn by the appropriate chromosomal material from Tripsacum, teosinte would be the result. The fact that corn and Tripsacum have been successfully interbred,[23] argues for the hybrid origin of teosinte.

This particular analysis is inconsistent with the hypothesis that all chromosomal knobs in corn and teosinte are ultimately derived from Tripsacum. If the Tripsacum material in teosinte is concentrated in four sections of the chromosomes, we should expect to find a high concentration of knobs in those four sections. Such is not the case; the knobs of "pure" teosinte are scattered among all of the ten chromosomes. If the previous analysis is correct and if the knobs on the chromosomes of teosinte and corn are of Tripsacum origin, teosinte either acquired considerably more than four sections of Tripsacum chromosome material, or the knobs have broken off from the original four sections and have multiplied irrespective of the gene-bearing material which accompanied them. The former alternative has been followed by Mangelsdorf and Cameron in a recent paper[24] though the inconsistency with the previous work remains unexplained.

[21] Mangelsdorf and Reeves, 1938, 1939.

[22] These knobs are dark staining structures on the chromosomes and are of unknown function. Their characteristic distribution on the chromosomes have made possible the accurate identification of each of the ten chromosomes in corn and teosinte. (Longley, 1937, 1938, 1941a, 1941b, Rhoades and McClintock, 1935.)

[23] One might well question the ability of these species to interbreed under natural conditions. Mangelsdorf and Reeves (1931) produced this cross only under very special experimental conditions.

[24] Mangelsdorf and Cameron, 1942, p. 238.

According to Mangelsdorf and Cameron, material with low knob counts are said to possess long slender cobs with even rows of strongly flattened kernels. In so far as these characters are concerned, the corn pictured by Will and Hyde from the northern Plains Indians[25] certainly should possess numerous knobs. Knob counts on corn from these groups are however remarkably low.[26]

Longley. Using the same kind of data, Longley has suggested that chromosomal knobs are characteristic of the related forms, teosinte, Tripsacum, the hypothetical wild ancestor of corn, and those varieties of domesticated corn which have not been removed from the centers of domestication. His theory would attribute the lack of knobs in the corns from the northern Plains and Peru to progressive loss under prolonged domestication in isolation from the parent stock,[27] a theory similar to that proposed by Vavilov.[28]

He further suggested (and it is only a suggestion!) that wild corn and teosinte may have been extreme variants of a single diverse group of closely related forms.[29] He would derive these from an essentially teosinte-like ancestor on the basis of chromosome morphology alone. He further attempts to show[30] that, as one moves from the "pure" teosinte of southern Guatemala toward the more corn-like forms in Mexico, the total amount of knob material decreases in spite of the fact that the actual numbers of knobs increases. This analysis of knob size in teosinte has been criticized by Mangelsdorf and Cameron.[31]

Longley is hardly justified in deriving corn from teosinte on the basis of chromosome morphology alone. Gross morphology must also be considered. It would be more consistent with other data to state that since "pure" teosinte is the more highly specialized form, the common ancestor of corn and teosinte may well have resembled corn. This revision of Longley's hypothesis would be consistent with his previous suggestion that a decrease in the number of knobs is indicative of movement away from a point of dispersal. If subsequent analysis of the various forms of teosinte should support this hypothesis, without revision of Longley's data, it would appear that the center of dispersal of the teosinte-corn complex, as indicated by high knob count and more generalized forms, might be in the general vicinity of Mexico City with the implication that the more corn-like variants differentiated farther north, perhaps in Durango or the American southwest. A detailed analysis of the various forms of teosinte and their relationship to the corn varieties grown in surrounding areas will have to be undertaken before this hypothesis can be adequately tested.[32]

In general it may be said that the significance of the knobs on the chromo-

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[25] Will and Hyde, 1917. [26] Longley, 1938, p. 191. [27] Longley, 1938, p. 194.
[28] Vavilov, 1926. [29] Longley, 1941a, p. 412. [30] Longley, 1941a, 1941b.
[31] Mangelsdorf & Cameron, 1942, pp. 241–243.
[32] Personally, I would like to know what happens to teosinte when it crosses the southern border of Guatemala. To date it has not been reported from Honduras or Salvador but its distribution would indicate that it might be expected from those countries.

somes remains to be determined. Mangelsdorf and his co-workers treat them as completely independent units whose size and position are of no significance. Longley on the other hand thinks that size and position are of considerable significance, and that the mere number may be an expression of a relatively few genetic and morphological factors.

Until more careful and painstaking work has been done to establish the extent to which knobs are actually connected with factors now thought to be genetic, there is little that can definitely be said about their significance. As can be seen from the above discussion, the present data can be read as readily in one direction as in another.

It is impossible to make an adequate phylogenetic study of a plant like corn upon the basis of a single morphological character, such as knobs on the chromosomes. If a number of characters were taken together and sufficiently detailed studies made to assure that the various criteria were really significant, there is no doubt that the history of corn for a considerable period, possibly even its origin, could be determined. The present uncorrelated information, all too often based upon inadequate samples, is not satisfactory for an attempt at historical reconstruction. Until detailed descriptions of the races of corn, such as those of Anderson and Cutler[33] are available in sufficient quantity to provide a body of data, we can not hope to obtain significant results from a study of the plant itself.

III. CURRENT HYPOTHESES

We turn now to a discussion of the hypotheses which underlie the various theories dealing with the origin of corn and similar phenomena. In the past it has been assumed that this kind of material was subject to botanical analysis only, and that anthropological participation was limited to a discussion of the end results of the botanists' investigations and to parallel analysis of the anthropological data. In the following discussions of (A) morphology, (B) age, and (C) areal distribution, it will be seen that anthropological data are often essential to analysis of these problems.

A. Influence of Domestication upon Plant Morphology. The theory underlying the discussion of the origin of cultivated plants from their wild ancestors could be formulated only after the establishment of the theory of evolution. In his first analysis of this problem in 1855 de Candole[34] assumed that cultivated plants, cereals particularly, must have grown wild in essentially their present state. Darwin[35] offered serious objection to this attitude in 1868, showing that there was considerable variation in plants and animals under domestication

[33] 1942. [34] Quoted by Darwin, 1876, vol. 1, p. 324.
[35] Darwin, 1876 (First edition 1868).

and that this variation involved primarily those structures for which the plant or animal was raised. De Candole subsequently agreed with Darwin's analysis.[36]

More recently Mrs. Arber summarized the characteristics of domesticated cereals:

1. Annuals rather than perennials. This insures a more or less simultaneous maturity in place of the gradual and lingering seeding of perennials.[37]

2. Toughness of the stem by which the seeds are attached. In most wild grasses the stems by which the seeds are attached to the parent stalk become fragile at maturity, enabling the ripe seeds to break off from the parent stock and to scatter over the surrounding countryside. Under domestication this fragility disappears, making it possible to gather the ripe heads without losing the grains.[38] The difficulties of harvesting a grain whose seeds are easily dispersed at maturity can be readily seen in Jenks report on the wild rice gatherers of the Great Lakes area.[39]

3. Increase in the amount of food stored in the grain far above the actual requirements of the growing seedling.[40] Sugar cane—in contrast to grains which are selected for fertility—is a perennial and since the store of sugar in the stem would be exhausted by the act of flowering, it is selected for sterility.[41] Thus the effects of domestication are not random variations but are adaptations to the specific needs of the cultivators. In the analysis of changes under domestication it becomes imperative to know the purpose for which the plant or animal is used.

In his discussion of the wild ancestor of our modern corn, Weatherwax[42] attributes the following changes to the effects of domestication:

1. Loss of perennial habit resulting in annual form.
2. Increase in size of the grain.
3. Increase in size of the ear, accompanied by
4. Decrease in amount of branching and length of side branches.
5. Decrease in number of ears per plant.
6. Isolation of color varieties.

To these we may add:

7. A tendency for the central axis or cob to become tough, rather than brittle.[43]

None of these characteristics appear in any of the wild species closely re-

[36] de Candole, 1892, p. 12. [37] Arber, 1934, p. 37. [38] *Ibid.*, pp. 38–39.
[39] Jenks, 1900, pp. 1058 ff. [40] Aber, 1934, p. 228. [41] *Ibid.*, p. 53.
[42] Weatherwax, 1935, pp. 52–55.
[43] Following Collins, 1912, p. 525, Mangelsdorf and Cameron, 1942, p. 238. Weatherwax attributes non-shattering cob to the wild ancestor.

lated to corn.[44] On the contrary they are, as we have seen, the expression in corn of those changes which are commonly found in most domesticated cereals. Thus if corn differs from what appears to have been its wild prototype only in those characters which in other cultivated grains are the result of domestication, it would seem unnecessary to attribute the presence of these characters in corn to inter-breeding with other genera such as toesinte or Tripsacum. This does not mean, however, that certain minor characteristics found in a few forms may not be the result of intermixture in relatively recent times.[45]

In so far as it can be shown that there is an intensification of those characters in corn which are the result of domestication we are justified in speaking of relatively primitive and of relatively advanced varieties.[46] It should be remembered, however, that the wild ancestor of corn was undoubtedly one of the most highly evolved species in the grass family and, in terms of evolution through geologic time, this wild corn certainly can not be considered "primitive." In the same manner, the physical anthropologist may speak of Sinanthropus as being a primitive type of man without implying that he was a primitive anthropoid.

B. How Old Is Cultivated Corn? It has been claimed that since corn alone among all the grains has no known ancestral form, it must have been under cultivation for long ages.[47] However, a glance at the cultivated grasses listed by Hitchcock[48] shows that about half of them are without known wild ancestral forms. Ames not only denies known ancestral forms for such well known plants as wheat and the soy bean, but makes the general statement that "The most important (cultivated) annuals—are unknown in the wild state".[49] Thus corn is far from being unique among cultivated plants in lacking a known wild ancestral form.

It has also been argued that since corn, as we known it today, is completely dependent upon man for propagation it must be of great age.[50] Actually the characteristics which are vital in adapting a wild food grain to human cultivation are precisely those which prevent the plant from growing wild.[51] Very few indeed of our cultivated grains are capable of surviving for any length of

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[44] Mangelsdorf and Cameron (1942, p. 229), attribute toughening of the cob in corn to Tripsacum influence. Since the rachis in Tripsacum itself is fragile (Hitchcock, 1935, p. 767), this effect upon corn in breeding experiments must be explained on some other basis.

[45] For example teosinte-like chromosome in corn (Longley, 1938, p. 194) and corn-like characters in Tripsacum (Cutler quoted by Mangelsdorf and Cameron, 1942, p. 232).

[46] Cf. Weatherwax, 1936, pp. 17–18.

[47] Collins, 1919, p. 418. [48] 1935. [49] Ames, 1939, p. 120.

[50] Collins, 1919, p. 418. Kempton, 1936 " . . . maize may be said to be the most completely domesticated grain. The botanical evidence on this point is unequivocal." p. 21.

[51] Arber, 1934, pp. 37–39. Hackel, 1890, p. 28.

time without the aid of man. Occasionally a few plants will seed themselves in an abandoned field, though this is less true of corn than of those grains which the seed-bearing head is not covered by a husk. In general, dependence upon man is a criterion of domestication, not of age.

Much has been made of the proposition that corn must be of great age because of the length of time necessary to develop it from the supposed ancestral species. This argument takes various forms:

1. Corn has not changed significantly as revealed in the archeological record (Weatherwax).
2. It would take 20,000 years to change corn (Collins).
3. Civilized man has not been able to duplicate the process within the historic period (de Candole).
4. Corn is so dependent upon man that the two of them must have evolved together (Ames).

These various arguments seem to be part and parcel of the same line of thought: cultivated species are today what they have been for long ages, and change comes so slowly that it can be measured only in terms of geologic time.

This attitude toward domesticated plants does not appear to be justified by the data at hand. Corn for example has changed significantly during the archeologically known period. Early finds of corn from South America,[52] in the Southwest[53] and the Mississippi Valley[54] uniformly possess distinctly smaller cobs than are known among modern varieties. Where grains are present they are flinty in texture and small in size. Colored cobs are frequent. In terms of domestication these appear to be "primitive" characters.[55] This same lack of size characterizes the manioc and sweet potato tubers found in early graves on the coast of Peru.[56] A similar situation exists in Europe where the seeds of our present varieties of wheat, barley, oats, pears, beans, lentils and poppy exceed in size those which were cultivated in Switzerland during the Neolithic and Bronze periods.[57] This would seem to indicate that both in Europe and in America the changes typically introduced in cultivated plants by domestication have been intensified during the known prehistoric period.

Estimates of the time necessary to change corn from a wild form to its domesticated form have been made. Collins suggested that "excluding gross mutation and assuming anything like a uniform rate of change 20,000 years would seem well below the time required."[58] Weatherwax has offered serious objection. "The fallacy of this view lies in an incorrect picture of the wild plant and in the assumption that its domestication moved at a uniform rate—

[52] Nordenskiöld, 1933, p. 289. [53] Wissler, 1933, p. 180. [54] Jones, 1936.
[55] Cf. Vavilov, 1926. [56] Nordenskiöld, 1933, p. 289 (quoting Tello).
[57] Darwin, 1876 (quoting Herr). (p. 200). [58] Collins, 1930, p. 203.

progress has been frequently far from uniform."[59] Such data as are available on other plants under domestication indicate that the changes from a wild form and the development of a relatively large number of diverse varieties may have occurred within a relatively short period.

As early as 1882 de Candole wrote "Men have not discovered and cultivated within the last two thousand years a single species which can rival maize, rice, the sweet potato, the potato, the bread-fruit, the date, cereals, millets, sorghums, the banana, soy...." This statement has been repeated in many forms by many investigators.[60] The implication that civilized man is unable to domesticate wild plants, would, if true, be a powerful argument for the remote antiquity of all our cultivated grains.

The truth of the matter is that with a world culture today we have more basic food crops than we really need.[61] Why should we develop something comparable to wheat? When wheat is not available we make bread out of rye, rice, potatoes, or soy beans. Look what we have done with corn, that "marvellous strange plante" which we inherited from the American Indian. We do not use it as a basic cereal for human consumption but use most of it to feed animals and of the small remainder which we ourselves consume, a large proportion of it is cooked as a vegetable. But this does not mean that we are incapable of producing new plants out of wild forms. No one who has been at all familiar with the changes in our fruits and vegetables within the past few years could consider that we are completely unable to develop new crops out of old ones. At least some of these forms have been domesticated in recent times. For example the cultivation of the strawberry[62] began less than 600 years ago and commercial strawberry raising is even more recent. In 1712, a wild form was imported into Europe from Chile and the first commercial strawberry was developed from this within the next half century. Improved forms of the native strawberry of the eastern United States were in cultivation in America in 1800. By 1917, over 1800 varieties had been developed in North America alone, all of them apparently from New World sources.

It would be dangerous to reason from strawberries to corn, and from controlled commercial breeding to Indian selection. The fact remains however that we are not justified in attributing to primitive cultures the sole ability to domesticate plants, nor to insist that all domestication worthy of the name took place long ages ago.

In short we do not know when the cultivation of corn began. The archeological record goes back many hundreds of years, but fails to show anything

[59] Weatherwax, 1936, p. 17. [60] Ames, 1939, p. 10, discusses this at length.

[61] Cf. Russian botanists' discussion of significance of various sources of starch food (Sauer, 1936, p. 291). Also the failure of corn to replace wild rice in Great Lakes area, and the disappearance of *Iva* and *Ambrosia* from cultivation in Mississippi valley (Jones, 1936, pp. 150–151).

[62] The following data from Fletcher, 1917, pp. 3263–3264.

earlier than the birth of Christ. It would be very surprising indeed if the first cultivation of corn does not pre-date the relatively advanced cultures of this period, but at present this is totally unconfirmed by actual evidence, botanical or archeological.

C. The Distribution of Wild Relatives. It has been argued that since corn and teosinte are related they must have grown wild in essentially the same area. Assuming for the moment that true teosinte is known only from southern Guatemala and that all other forms are the result of hybridization with corn and owe their present distribution to man, let us see exactly what this argument really means.

Tripsacum is found in various forms from Paraguay to Massachusetts. If the present range of the genus is to be considered indicative of the range of the common ancestor of corn, Tripsacum and teosinte, we must admit the possibility that this generalized ancestor might have grown almost anywhere from the northern border of the South Temperate Zone to the Northeastern part of the United States. This would mean that the domesticated ancestor of our modern corn was growing wild, in all probability, somewhere within this range.

Let us suppose that most of the species of Tripsacum were to die off, as have the common ancestral forms of Tripsacum, corn and teosinte, leaving only *Tripsacum floridanum*, *T. australe* and *T. pilosum*. These species would have, under these conditions, a discontinuous distribution in South America, Middle America, and Florida.[63] A similar situation exists among the American species of allied genus *Roettobollia*.[64]

If such distributions exist among the species of two genera of the general type to which corn belongs, we are justified in postulating a similar discontinuity for the distribution of teosinte and wild corn, which it should be remembered are (at least in the writer's opinion) distinct genera and as such might be expected to have been separated longer than the less differentiated species of a single genus.

If this argument is valid, we must admit the possibility of a wild corn in South America, or even within the boundaries of the United States. However, these more remote areas, though possible locations of wild corn are not as probable as those areas closer to the center of distribution of Tripsacum and teosinte. Ethnological and linguistic reconstructions of agricultural origins have not been very convincing. Linton, excluding data of the historic period has made an ethnological reconstruction in which he "finds" that corn was probably developed in northern French Equatorial Africa shortly after the establishment of neolithic culture in that region.[65]

[63] Data on Tripsacum distribution from Cutler and Anderson, 1941.

[64] Data from Hitchcock, 1913, 1922, 1927, 1930, 1935, Hitchcock and Chase, 1917.

[65] Linton, 1936, p. 379.

Undoubtedly the final word in this matter, if indeed it is ever written, will come from an analysis of the archeological record. Archeological evidence does not present us with any data that are applicable to the period at which corn first appears except perhaps in the southeast and possibly the southwestern portions of the United States. These will be mentioned in a moment. In the virtual absence of adequate data from this source about all we can do is to review the various possible areas and to "place our bets accordingly." For purposes of clarifying the situation let us suppose that we have the sum of ten dollars at our disposal, and that we will divide the sum and place it on the map in accordance with the probabilities that corn was domesticated in that particular vicinity.[66]

First of all can we eliminate the possibility that corn originated in the Old World? One is tempted to say "Yes, definitely." Perhaps we ought to be a little cautious. Kempton has suggested that corn and sorghum may prove to be more closely related that is now thought possible.[67] We know that the gourd of pre-Columbian American agriculture had its botanical origin in the Old World. Its cultural origin in the Americas has never been proved.[68] If it should appear that it was brought to America by cultural rather than natural means, and that American agriculture, therefore, was not wholly indigenous, the certainty with which we now state that corn is of New World origin might have to be modified. Nevertheless, as things stand today, the chances of corn having originated in the Old World are virtually nonexistent. Perhaps all we can afford here is the price of a folder (5¢) in which to keep such data as might indicate an Old World origin..... $00.05.

It seems fairly well established that corn did not develop directly from cultivated teosinte. It seems equally probable that corn did not grow wild in the immediate vicinity of wild teosinte, but was separated by some geographical barrier. Weatherwax has suggested that these two wild grasses might have been growing in adjacent mountain valleys.[69] In general, however, it seems that the area in which teosinte now grows wild probably was not the place at which corn was first domesticated. Perhaps we could afford another nickel folder for this possibility..... $00.05

The great centers of Indian culture are often cited as indicative of agricultural origins. High cultural centers of remote and unknown origin are present in both North and South America. Great diversity of corn types are reported

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[66] The basis for these figures is not to be found in any complex mathematical calculation. They represent an attempt on the part of the writer to substitute relatively concrete figures for such face-saving terms as "Highly improbable," "Very unlikely," "Possible but improbable," etc. They are, in short an expression of an opinion based on extensive reading of the available literature. They are far from final and are subject to many errors.

[67] Kempton, 1936, pp. 26–27. [68] Nordenskiöld, 1933, p. 271.

[69] Weatherwax, 1935, p. 68.

from both of these areas. To be sure, teosinte, a moderately close relative, grows in Middle America, but it may be that this is the result of the hybridization of corn and Tripsacum. In any case, we must exclude the area in which Teosinte grows wild. In brief, the cultural and botanical evidence is not conclusive in either direction. Personally I think that the chances are about equal.

Middle American Cultural Center $3.00
South American Cultural Center $3.00

An unusual type of corn has been reported from the lowlands of South America.[70] It is not well understood botanically nor is its cultural context known. This area appears to be well adapted for a wild corn. It looks like a good possibility[71] $2.00

The hypothesis has been suggested that corn and teosinte are divergent forms of a single group of allied species which range from southern Guatemala, where "pure" teosinte grows wild, to central and northern Mexico, where more corn-like forms are found as weeds in corn fields.[72] If these corn-like teosintes are actually remnants of former wild populations, and not, as is commonly supposed, the results of mixtures of corn and teosinte within recent times, we may postulate a wild corn somewhere in Mexico or the American Southwest. This hypothesis is strengthened by the fact that the corn varieties in the Southwest today show considerable variation, that native beans have been domesticated in this area[73] and that the area may once have been more favorable for wild corn than it is today.[74] It appears to have been a secondary center for the development and distribution of lima beans.[75] The archeological record for the northern portion of the Southwest shows relatively primitive types of corn in the early Basketmaker periods. Subsequent developments in corn types are attributed to outside influences, but our ignorance of the neighboring areas to the south, particularly in regard to their agricultural complexes, is still considerable. Until the agricultural base of the supposedly contemporaneous cultures to the south can be demonstrated, there remains some possibility that corn could have originated in this area. It does not look likely, but is a possibility $1.00

Of the remaining areas in which corn was cultivated and in which its wild relatives are found today, the eastern United States has little claim to being the place of origin. The people around the Great Lakes were too well provided with wild rice to be interested in the domestication of another wild plant source of starch. Climate and the archeological record from the northeastern portion

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[70] Mangelsdorf and Reeves, 1939. Weatherwax, 1936, p. 6.

[71] A recent letter from Dr. Cutler indicates that he has additional information from this area. When his data are available, they may materially change this picture.

[72] Longley, see preceding discussion.

[73] The tepary bean. Freeman, 1912, p. 618.

[74] McGregor, 1941, p. 114. [75] Mackie, 1943, p. 6.

indicates pretty clearly that this was not a potential area. Farther south in the Mississippi Valley we know that other crops were domesticated by relatively primitive cultures at a moderately early date.[76] The archeological record, though vague at present, seems to show that corn came into this area at a relatively late date. When the archeological record from this area has been clarified and the nature of the early agricultural complexes in this area are better understood, the situation will undoubtedly be definite. At the moment, particularly in view of the presence of an agricultural complex apparently native to this area, it remains a remote though tantalizing possibility...$0.30

Eastern South America is another area in which corn agriculture appears to be intrusive rather than native. Throughout much of this area, corn was not cultivated and certainly could not have grown wild. There are, however, some highland areas which are adapted to corn growing and presumably to the growth of the wild corn plant. Here again the chances seem quite low. .$0.30

The west coast of South America also seems to have been an unlikely place. Though conditions in some sections made corn growing possible they do not seem adapted for the growth of the wild plant.....$0.20

The only remaining area, the West Indies likewise appears to offer little promise.....$0.10

SUMMARY OF PROBABILITIES

The Old World	$0.05
The area of "pure" teosinte	$0.05
High cultural centers of South America	$3.00
High cultural centers of Middle America	$3.00
Lowlands of Southeastern South America	$2.00
Highlands of northern Mexico and American Southwest	$1.00
Southeastern United States	.30
Eastern South America	.30
West coast of South America	.20
West Indies	.10
Complete Certainty	$10.00

SUMMARY

1. The intense interest among Americanists in the origin of corn has been stimulated by an early theory, long since disproved, that corn is the domesticated form of teosinte. This theory has had more influence than it deserves due to the failure of the anthropologists to understand the botanical literature.

2. No single current theory is completely satisfactory and the exact interpretation of much of the critical data is in doubt.

[76] Jones, 1936.

3. Methods of describing corn varieties are now being developed and the eventual historical reconstruction of the history of corn during the Christian era, at least, is becoming a possibility.

4. The importance of man in the domestication of a wild plant must be taken into consideration in any discussion of the morphological changes which have taken place during that process. The use of the term "primitive form" in this connection needs careful definition.

5. There is no satisfactory conclusion regarding the age of cultivated corn. On archeological grounds it must antedate the birth of Christ. The writer finds no valid botanical evidence to indicate that it was *necessarily* much earlier than this.

6. A study of the distribution of wild relatives of corn does not yield conclusive results.

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BIBLIOGRAPHY

Ames, Oakes
1939. *Economic annuals and human cultures.* Cambridge: Botanical Museum of Harvard University. Pp. 153.

Anderson, Edgar and Hugh G. Cutler.
1942. "Races of Zea Mays: I. Their recognition and classification," *Annals of the Missouri Botanical Garden*, 29: 69–88.

Arber, Agnes
1934. *The Gramineae.* New York: Macmillan Co. Pp. 480.

Candole, Alphonse de
1892. *Origin of cultivated plants.* New York: D. Appleton & Co. 1892. (Original French Edition, 1883.)

Cole, Mabel Cook and Fay-Cooper Cole
1938. *The Story of Man.* Chicago: University of Knowledge, Inc. Pp. 381.

Collins, G. N.
1912. "The origin of maize," *Journal of the Washington Academy of Sciences*, 2: 520–530.
1919. "Notes on the agricultural history of maize," *Annual Report 1919, American Historical Association.* Pp. 409–429.
1930. "The phylogeny of maize," *Bulletin of the Torrey Botanical Club*, 57: 199–210.

Cutler, Hugh C. and Edgar Anderson
1941. "A preliminary survey of the genus Tripsacum," *Annals of the Missouri Botanical Garden* 28: 249–269.

Darwin, Charles
1876. *Variation of animals and plants under domestication.* Second edition (2 vols.), 1876 (first edition, 1868). New York: D. Appleton & Co. Vol. 1, p. 473. Vol. 2, p. 495.

Fletcher, S. W.
1917. "Strawberries," *Cyclopedia of Horticulture*, ed. by L. H. Bailey (6 vols. second edition. New York: Macmillan) 6: 3260–3264.

Freeman, G. F.
1912. "Southwestern beans and teparies," *University of Arizona Agricultural Experiment Station Bulletin* 68: 573–619.

Hackel, Eduard
1890. *The True Grasses.* Trans. by F. Lamson-Scribner and E. A. Southworth. New York: H. Holt & Co. p. 228.
Harshberger, J. W.
1893. "Maize, a botanical and economic study," *Contributions from the Botanical Laboratory, University of Pennsylvania* 1, No. 2: 75–202.
1896. "Fertile crosses of teosinte and maize," *Garden and Forest* 9: 522–523.
1907. "Maize or Indian corn," *Cyclopedia of American Agriculture.* Ed. by L. H. Bailey (4 vols. first edit., New York): Macmillan 2: 398–402.
Hitchcock, A. S.
1913. "Mexican grasses in the U. S. National Herbarium," *U. S. National Museum, Contributions from the United States National Herbarium* 17, Pt. 3: 181–389.
1922. "Grasses of British Guiana," *ibid.* 22, Pt. 6: 439–515.
1927. "Grasses of Ecuador, Peru and Bolivia," *ibid.* 24, Pt. 8: 291–556.
1930. "The Grasses of Central America," *ibid.* 24, Pt. 9: 557–762.
1935. "Manual of the grasses of the United States," *United States Department of Agriculture, Miscellaneous Publication No. 200.* Pp. 1040.
Hitchcock, A. S. and Agnes Chase
1917. "Grasses of the West Indies," *U. S. National Museum, Contributions from the United States National Herbarium* 18, Pt. 7: 261–471.
Jenks, A. E.
1900. "The wild rice gatherers of the Upper Lakes," *Bureau of American Ethnology, Annual Report* 19, Pt. 2: 1013–1137.
Jones, Volney H.
1936. "The vegetal remains of Newt Kash Hollow Shelter," in "Rock shelters in Menifee County, Kentucky," by W. S. Webb and W. D. Funkhouser (*University of Kentucky, Publications of the Department of Anthropology and Archaeology* 3, No. 4). Pp. 147–165.
Kempton, J. H.
1936. "Maize as a measure of Indian skill," *Symposium on prehistoric agriculture. University of New Mexico Bulletin* 296, *Anthropological series* 1, No. 5: 19–28.
Kidder, A. V.
1936. "Speculations on New World prehistory," *Essays in Anthropology presented to A. L. Kroeber.* (Berkeley: University of California Press). Pp. 143–152.
Kroeber, A. L.
1923. *Anthropology.* New York: Harcourt Brace and Co. Pp. 523 and 32.
Linton, Ralph
1936. *The Study of Man.* New York: D. Appleton-Century Co. Pp. 503.
Longley, A. E.
1937. "Morphological characters of teosinte chromosomes," *Journal of Agricultural Research,* 54: 835–862.
1938. "Chromosomes of maize from North American Indians," *ibid.,* 56: 177–196.
1941a. "Knob position on teosinte chromomes," *ibid.,* 62: 401–413.
1941b. "Chromosome morphology in maize and its relatives," *The Botanical Review* 7: 263–289.
Lowie, Robert H.
1938. "Subsistence," Chap. 7 in *General Anthropology.* Ed. by Franz Boas (Boston: D. C. Heath and Co.) Pp. 282–326.
Mackie, W. W.
1943. "Origin, dispersal, and variability of the Lima Bean, Phaseolus lunatus," *Hilgardia* 15, No. 1: 1–29.

Mangelsdorf, P. C. and James W. Cameron
1942. "Western Guatemala, a secondary center of origin of cultivated maize varieties," *Harvard University, Botanical Museum Leaflets* 10, No. 8: 217–250.
Mangelsdorf, P. C. and R. G. Reeves.
1931. "Hybridization of maize, Tripsacum and Euchlaena," *The Journal of Heredity* 22: 329–343.
1938. "The origin of maize," *Proceedings of the National Academy of Science*, 24: 303–312.
1939. "The origin of Indian corn and its relatives," *Texas Agricultural Experiment Station Bulletin* No. 574. Pp. 315.
McGregor, John C.
1941. *Southwestern Archaeology*. New York: John Wiley & Sons, Inc. Pp. 403.
Nordenskiöld, Erland
1933. "Origin of Indian Civilization in South America," *The American Aborigines*. Ed. by Diamond Jenness. (Toronto: University of Toronto Press). Pp. 247–311.
Rhoades, M. M. and Barbara McClintock
1935. "The cytogenetics of maize," *The Botanical Review* 1: 292–325.
Sauer, Carl
1936. "American agricultural origins," *Essays in Anthropology presented to A. L. Kroeber* (Berkeley: University of California Press). Pp. 279–297.
Spinden, H. J.
1915. "The origin and distribution of agriculture in America," *Proceedings of the Nineteenth International Congress of Americanists*, Washington. Pp. 269–276.
1928. *Ancient Civilizations of Mexico and Central America*. "American Museum of Natural History, Handbook Series" No. 3. Pp. 270.
Thompson, J. Eric
1936. *Archaeology of South America*. "Anthropology Leaflet, Field Museum of Natural History" 33. Pp. 160.
Vavilov, N. J.
1926. "Studies on the origin of cultivated plants," *Bulletin of the Bureau of Applied Botany and Plant Breeding* (Leningrad) 16, No. 2: 1–248.
Weatherwax, Paul
1935. "The phylogeny of Zea Mays," *American Midland Naturalist* 16: 1–71.
1936. "The origin of the maize plant and maize agriculture in ancient America," *Symposium on Prehistoric Agriculture, University of New Mexico Bulletin* 296, *Anthropological Series* 1, No. 5: 11–18.
Will, George F. and George E. Hyde
1917. *Corn among the Indians of the Upper Missouri*. St. Louis: William Harvey Miner Co. P. 323.
Wissler, Clark
1922. *The American Indian*. Second edit. New York: Oxford University Press. Pp. 474.
1933. "Ethnological diversity in America and its significance," *The American Aborigines*. Ed. by Diamond Jenness. (Toronto: University of Toronto Press). Pp. 167–216.

GAMES OF THE MOUNTAIN TARASCANS[1]

By RALPH L. BEALS *and* PEDRO CARRASCO[2]

ONE of the major changes in the field of Americanist studies in recent years has been the recognition of an increasing number of parallels between the simpler cultures of South America and those of North America. In a recent article in this journal, Dr. Robert H. Lowie reviewed some of the evidence and summarized the significance of the problems for American culture history.[3] One difficulty in interpreting the parallels now on record has been the absence of intervening cases between northern South America and the United States border. A decade ago the senior author of this paper pointed out evidence of parallels with South America to be found in northern Mexico and ventured to suggest that they represented the peripheral survivals of a culture once found in the Central and South Mexican and Central American areas which had been supplanted by the development of the high cultures.[4] Such a view would be greatly strengthened if survivals of such traits could be found in the intervening region of Middle America.

One striking parallel between North and South America is the occurrence of games similar to hockey in the Gran Chaco and among the Araucanians.[5] Despite the presence of elaborate ball games of different types in the intervening regions, hockey is strikingly absent. The major importance of the present paper is the recording of a hockey game still existing among the Tarascans in a region of high Middle American culture. As the modern Tarascans are notably deficient in games, associated types are also described, including a form of *quince* or patolli and two European games.

The presence of European games might suggest a post-Conquest introduction of hockey. Variants of the European games, however, are widespread in

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[1] This paper is a contribution of the Program for Anthropological Investigations among the Tarascans, a cooperative program of the University of California and cooperating Mexican institutions. See AMERICAN ANTHROPOLOGIST, 42, 1940, pp. 708–711.

[2] The data for this paper were collected by Sr. Carrasco in 1940–1941 while working as a student assistant from the Instituto Politécnico Nacional under the direction of the senior author. The senior author's part in this paper consists of field direction, translation and editing, and the writing of the introductory paragraphs. With one exception the games described are all from Angáhuan, a large village in the *municipio* of San Juan Parangarukutíri, about 25 miles west of Uruapan, Michoacán. The village is notably conservative in outlook and customs and the games described are not known in most Tarascan villages.

[3] Robert H. Lowie, *American Culture History* (AMERICAN ANTHROPOLOGIST, 42, 1940), pp. 409–428.

[4] Ralph L. Beals. *Comparative Ethnology of Northern Mexico Before 1760* (Ibero-Americana 2, 1932), pp. 151–152.

[5] Erland Nordenskiöld, *Comparative Ethnographic Studies* 9, p. 8; Alfred Métraux, *El Hockey, Deporte de los Indios Chaqueños y de los Araucanos* (La Prensa, Buenos Aires, July 14, 1940, Section 3).

Mexico, while hockey hitherto has not been reported. Neither is there evidence that hockey type games were ever played by the Spanish. Angáhuan, the only village for which the game is reported, is one of the most isolated and conservative Tarascan villages. The games follow:

Uáɾukuni.[6] The game is played by two opposing sides of equal numbers. Any number may play. Each player has a stick, *uáɾukarákua*, in either of the two forms shown in figure 1. Mango wood is preferred. The ball, *tarándukua*, is often made of rags, but one made by winding cord about a center formed of a white substance secreted by the green worms of the madrone tree is preferred. The latter type of ball is called *tarándukua šanári.*

The game is always played around a block of the town. The starting point is a street intersection. The two teams line up as shown in figure 2. A representative of each team stands in the center of the intersection. One throws the ball in the air and each player then tries to knock it toward his own team. The winning team must take the ball around the block back to the starting street intersection.

The teams are sometimes representatives of different blocks in the town. The block chief, an official appointed annually by the mayor for each block in the town, names the men who will play. Men so named may not refuse to play. The most important occasion on which the game is played is the day following the feast of Conception, December 8. This day is called *siráŋgua.* An official called the *kiéŋi*, who cares for the hospital (formerly a hospital in fact but now the residence of the *kiéŋi*; and the repository of ceremonial equipment) and runs errands for the heads of the ceremonial heirarchy in the church, makes an especially big ball of rags for the game. Two very large teams play with this ball, playing around each block of the town successively.[7]

Akúɕperani. Two men play with the same stick and ball used in *uáɾukuni.* The players start in the middle of a street and each attempts to knock the ball to an established goal.

Atáɾukuni. This game is played at Cherán, a large town 20 miles northeast of Urapan. Any number of players compete in two teams of equal size. Each player has a stick, *atáɾutákua*, curved at one end and from a meter to a meter and a half in length. The ball, *apásikua*, is made of rags wrapped with cord. The players line up opposite one another according to the numbers engaged (fig. 3). The contest begins in the middle of a block and each side attempts to take the ball to the opponents' end of the block. A representative of each team first tosses a coin or pot sherd at a line. The man whose piece is nearest the line

[6] The recording of native terms is in the official alphabet now being used by the Departamento Autónomo de Asuntos Indígenas.

[7] The resemblance to the winter hockey games of the Southwest is very suggestive. Silvia Rendón writes that the game is played daily from December 9 to Carnival and that each block and every man competes during this period.

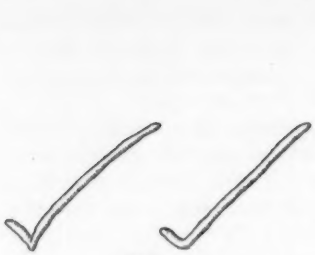

FIG. 1

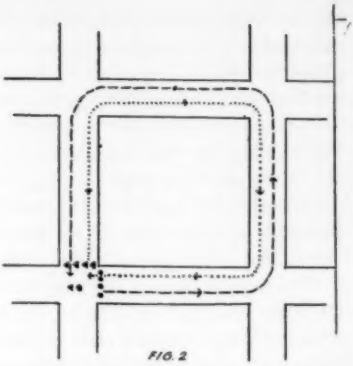

FIG. 2

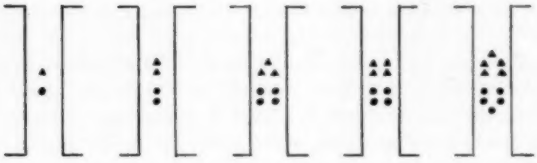

FIG. 3

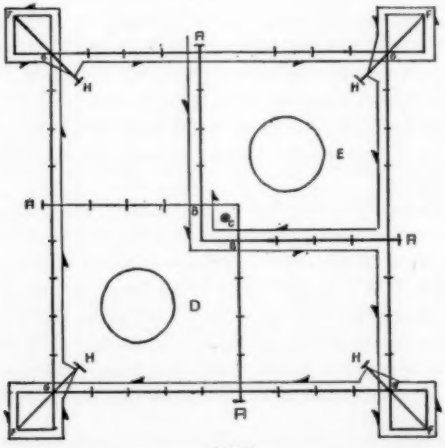

FIG. 4

Figure 1. Sticks used in *uásukuni*.

Figure 2. Arrangement of course around a town block of *uásukuni*. Players are shown at the starting position.

Figure 3. Various arrangements of players for *atásukuni*.

Figure 4. The board used for *kolicatákwa* or quince. The lighter line with arrows indicates the course followed by the pieces of one player. The letters are referred to in the text.

puts the ball in play, knocking the ball toward his opponents. If possible, he lifts the ball in the air as it is thus more difficult to stop. If the ball passes the end of the block, the last man of the team nearest that goal must go after it, followed by the other players of his team who are supposed to maintain a constant distance from him. Should all the players of a team have to pass the line at the mouth of a street in order to keep the proper distance, the game is won by the opposing team.

The game may also be played with two balls which are put in play one after another.

The game is played only by boys and unmarried young men in the dry season during the winter. It is said that the reason for this is that the streets are too wet in the rainy season. The game may be played in the fields; in this case lines are drawn to represent the street. The game has almost disappeared and few young persons even know it.

In Charápan the Angáhuan type of game is known. In Chilchota, a former Tarascan town now "mestizoized" and where Tarascan is no longer spoken, a similar game is played during the rainy season at a place called La Mesa where there is turf.

Professor José Corona Nuñez has also described a similar game in the former Tarascan town of Cuitzeo on the lake of the same name.[8] The ball is a piece of burning maguey root, 7 to 10 centimeters in diameter, which burns slowly but stubbornly. The game is played at night and the ball gives off showers of sparks when struck. The opposing teams represent different barrios.

Professor Corona states that several codices show gods playing ball with a sort of stick or racket. He also mentions rock paintings near Queréndaro, Michoacán, showing two ball players with sticks or rackets. Ball players with clubs, playing in an "I"-shaped court, are also shown in a mural recently discovered at Teotihuacan.

Kolíɕa atárakua.[9] This game is a version of *quince* or patolli. A course or track is drawn on the ground or on a board (fig. 4). Two players compete, each with four pieces called *moskúkua*. The players start at two opposing points (A in fig. 4) called *apórun*. The course followed by one player is indicated in the figure. Each piece is advanced in accordance with the score made by throwing four stick dice. The players take turns throwing the dice and moving the pieces. A player may apply the score made in one throw to only one piece.

If a piece comes to rest on the points marked B, it is said to be burned and must be started again at A, but until it is put in play again it must rest at point C, *kurínɕkua* or bonfire. While on the interior part of the course the pieces of the two players will never stop on the same spot, but on the outer part of the

[8] *El Nacional* (September 6, 1942, México, D.F., first section), p. 3.

[9] In Angáhuan the *ra* is often omitted, giving the form *atákua*. The "l" sound only occurs in Tarascan in borrowed words; probably *kolíɕa* is in this category, but its origin is not identified.

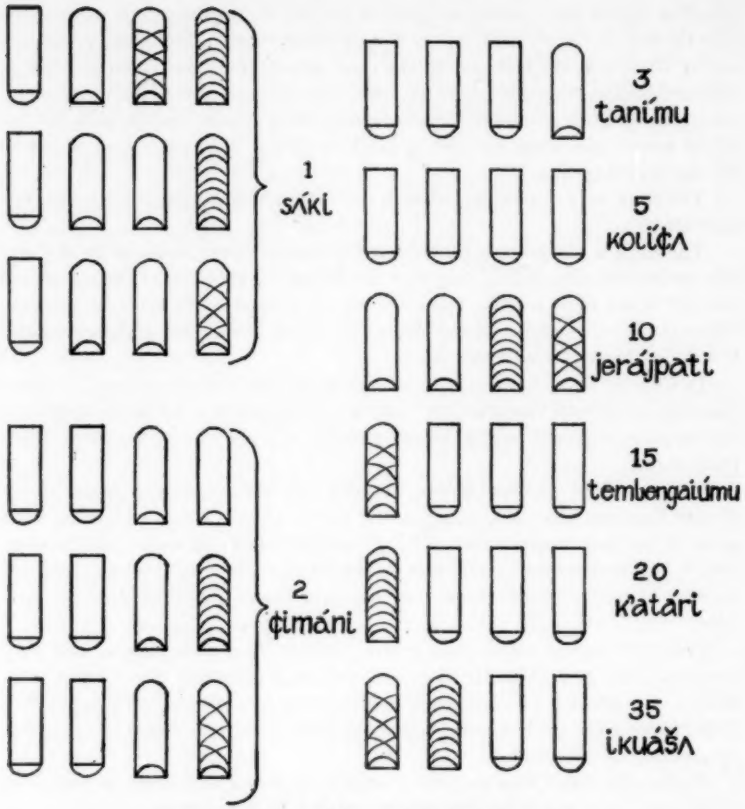

Figure 5. Scoring methods used for *kolicatákua* or quince.

route this may happen. In this case the second arrival "kills" the first, which then must begin again at A. Until put in play again a "killed" piece must stay in circles D or E according to the player to whom it belongs.

Points F are called *anájɬikun* or summit. Once a piece makes the circuit of a loop at the corner of the board, it does not touch point G a second time, but goes instead to point H, *unandándani*. In this way there is no possibility of confusion as to whether a piece is entering or leaving the loop.

To complete the course each piece enters the interior track a second time. If the piece safely reaches any spot past point B it is regarded as having finished the circuit. The player who first gets all four of his pieces past B wins the game.

The dice are called *kolíɕatárakua*. They are half round on one side, flat on the other and are about a palm breadth in length. Usually two sticks are split in half to make the four dice. The round side of one die is painted with parallel lines, while a second is painted with crossed lines. Figure 5 shows the markings and methods of scoring.

The game is played especially during the rainy season. On the eve of the feast of Assumption, August 15, it is played in the house of the caretakers of the saint or *cargueros*. On the day of the fifteenth it is played in the plaza. On this occasion money bets are often made.

Móskukua (*pieces*). This game is played by two players, each with twelve pieces which are placed on the board as shown in figure 6. The pieces may be

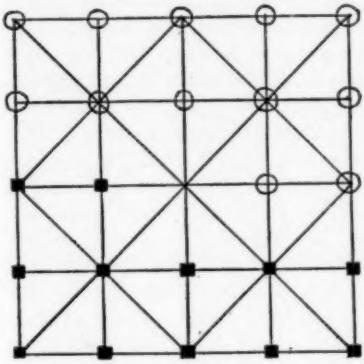

Figure 6. Starting arrangement of pieces for *móskukua*.

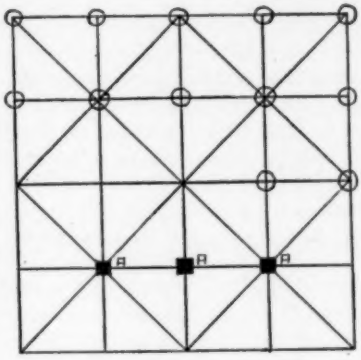

Figure 7. Starting arrangement of pieces for *kuato*.

advanced one space at a time unless there is an opponent's piece on the same line with a vacant space behind. In this case the piece jumps two spaces and "eats" the opponent's piece, putting it out of play. The player whose pieces are all eaten loses the game.

This game is also played during the rainy season and especially on the fourteenth and fifteenth of August, the feast of Assumption.

Kuato. This is the well known Mexican game of Coyote and Hens. It is played on the same board as *móskukua*. Twelve hens and one coyote are placed on the board as shown in figure 7. The coyote may be placed at any of the three spots marked A. The hens seek to encircle the coyote so the piece may not be moved. The coyote, on the other hand, seeks to eat all the hens, jumping over a piece and eating it whenever there is a vacant space behind a hen. There are no special times for playing this game.

When others of the more isolated and conservative Tarascan towns are studied, probably more games will come to light. In the more progressive towns, games seem to be almost totally lacking, except such Mexican innovations as card games. For example, at Cherán, which was the subject of intensive study, the only game encountered was *atáɹukuni* if one except the various European games of modern character. Even *atáɹukuni* is now rarely played and few of the young people known it.

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THE NAVAHO INDIANS AND THE GHOST DANCE OF 1890

By W. W. HILL

FOR years it has been the custom for most anthropologists to revert to economic determinism for an explanation of messianic phenomena. Recently, however, Bernard Barber in his paper *Acculturation and Messianic Movements*[1] called our attention to approaches other than economic, i.e., social, and during the past year Ralph Linton in his article *Nativistic Movements*[2] has outlined a whole new field for researches in the dynamics associated with revivalistic and perpetuative aspects of cultures. Stimulated by these two works I examined my field material on the Ghost Dance of 1890 among the Navaho and because the data therein varied so from accounts of other tribes, decided to present it for publication.

To those acquainted with Navaho Indians any mention of their association with the Ghost Dance of 1890 must seem anomalous. While strictly speaking no direct participation did occur, this messianic development reached the Navaho and the impact registered profoundly on the minds of the individuals of the period. According to Mooney[3] news of the movement was conveyed to the Navaho via the Paiute. This was confirmed by some Navaho.[4] However, others assigned it to the Southern Ute, while still others were unable to give any provenience. Most, however, agreed that while it was known throughout the reservation the focal point for the dissemination of the concepts was in the Shiprock, Nava [Newcomb] Tohatchi region, i.e., northwest New Mexico, a factor which lends weight to their probable diffusion from the Southern Ute.

Most of the familiar traits of the Ghost Dance complex, the resurrection of the dead, the removal of the whites, the reestablishment of the old order of life, and survival through compulsory belief and participation in the movement, were known to the Navaho. The most widespread and significant element was the reported return of the dead. This was variously expressed. Some informants simply state that the dead or ghosts were said to be returning. Elaboration on this theme included the statements that those who had died during the incarceration at Fort Sumner, and those who had been killed by enemies, were coming back, and that the headmen were leading the ghosts back to the reservation.

Other phases of the doctrine were also subject to individual elaboration.

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[1] Bernard Barber, *Acculturation and Messianic Movements* (American Sociological Review, Vol. 6, no. 5, 1941), pp. 663–669.

[2] Ralph Linton, *Nativistic Movements* (AMERICAN ANTHROPOLOGIST, Vol. 45, no. 2, 1943), pp. 230–240.

[3] James Mooney, *The Ghost-Dance Religion and the Sioux Outbreak of 1890* (14th Annual Report of the Bureau of American Ethnology, Washington, D. C., 1896, 1897), pp. 809–810.

[4] For purposes of validation, confirmation of later discussions, and to show degree of indoctrination, statements of informants are quoted in full in the appendix.

The vehicle for white elimination varied in its practical methods, some holding that they were to be exterminated, others that they would leave the Navaho area and return to their former habitat. It was thought that the arrival of the millennium would bring with it the return of the old order, social and religious, plentiful game, ample rainfall, and corn immune from disease. Those who believed in and participated in the movement were to live; those who were skeptical were to die.

It is clear that the Navaho were thoroughly cognizant of all the essential elements of the Ghost Dance of 1890. It has also been established that the movement failed to flourish or find acceptance. We have the testimony of informants alive during this period, the statement of Washington Matthews to Mooney,[5] and Barber's conclusions to this effect.[6] The reasons for this rejection pose some interesting problems in dynamics and configuration.

The question of why the Navaho failed to embrace a doctrine found palatable by so many Indian peoples of North America represents a situation probably unique in the history of messianic movements. Barber[7] has suggested that the rejection was due to a lack of social and spiritual "deprivation." This corresponds to an idea expressed many years ago by Wissler, in connection with the spread of the Ghost Dance in the Plains, and termed by him the occurrence of a cultural vacuum. I should like to present, however, an alternative possibility for the rejection of the 1890 Ghost Dance by the Navaho other than Barber's "life was integrated around a stable culture pattern."[8]

It appears that the lack of acceptance resulted from the functioning of phases of Navaho culture falling into categories described by Kluckhohn[9] as belonging to a covert pattern or configuration. The appended accounts show Navaho attitudes toward the Ghost Dance to have been ones of extreme ambivalence. It is apparent that the acceptance or rejection, *per se*, on the basis of the benefits which the movement promised were absent from the minds of informants. The question of "life integrated around a stable culture pattern"[10] (if such existed in 1890, it certainly did not in 1870 when according to informants a similar opportunity was rejected) was not a consideration in the decisions. In fact, the idea of rejection or acceptance was of minimum importance; the Navaho interest in the movement was a manifestation of anxiety as to whether or not the reports which reached them were true.

An underlying fear appears even in accounts of the most skeptical informants. It is expressed, according to Navaho pattern,[11] in references to abnormal

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[5] Mooney, *op. cit.* [6] Barber, *op. cit.* [7] Barber, *op. cit.* [8] Barber, *op. cit.*

[9] Clyde Kluckhohn, "Patterning as Exemplified in Navaho Culture," *Language, Culture, and Personality: Essays in Memory of Edward Sapir* (Menasha, Wisconsin, 1941), pp. 124–129.

[10] Barber, *op. cit.*

[11] W. W. Hill, *Stability in Culture and Pattern* (AMERICAN ANTHROPOLOGIST, Vol. 41, no. 2, 1939), pp. 258–260.

weather conditions which prevailed during the period, suspicion of witchcraft in connection with the purveyors of the movement, and post facto rationalizations of dire consequences both to individuals and property. All these were secondary expressions. The real anxiety concern was with the one element which was the core of the movement, i.e., the return of the dead.

Had the "economic" or "social integration" factors been compulsive, a selective element could have been expected to operate; the Navaho might gladly have embraced parts of the complex—the restoration of the old life and the disappearance of the whites—while rejecting the tidings that the dead were to return. However, the compelling element for them was clearly their fear of the dead; so much so that all other tenets were infected by it, hence suspect and to be rejected.

For the Navaho with his almost psychotic fear of death, the dead and all connected with them, no greater cataclysm than the return of the departed or ghosts could be envisaged.[12] In short, the Navaho were frightened out of their wits for fear the tenets of the movement were true. Thus, a covert pattern or configuration, deep-seated in the unconscious psychology of that people, acted as a barrier to the diffusion of a complex embraced by most of the tribes in western United States.

APPENDIX

The Late Fat One's Son, Tohatchi, N. M.: "The ignorant Navaho like myself were saying at this time, 'Look over toward Nava [Nava [Newcomb] is north of Tohatchi. The ghosts are thought to reside in the north.] they [ghosts] are there already at Nava and will soon appear on the high ridges between Nava and Cornfields.' Then they would mention the names of the different headmen who had died and who were leading the ghosts back. Among them they mentioned my own father. The majority of the people believed in this. Those who did not believe, would ask, 'What is the purpose of these ghosts coming back?' The believers would say, 'They are just coming back to live with us and to tell us of the things in the other world.' Some of the people were singing to prevent the ghosts from coming back; they were afraid of them. This lasted one whole summer but gradually died out because no ghosts appeared and because the unbelievers ridiculed the believers. They tried to find the source of this rumor but they could not find where it started. They decided that some woman must have started it." The informant said that he does not know how far the Ghost Dance spread but believes that it was known throughout the reservation. The ghosts were to bring with them much rain; there was to be quantities of game in the country again; they were to bring corn which was immune from all diseases; all the old customs were to be reinstated; everything was to be as it was in the beginning because these ghosts knew conditions on both sides [i.e., in life and death] and they were to combine things from both sides and make things perfect. Some of the men even told people that they

[12] L. Wyman, W. W. Hill, and Iva Osonai, *Navajo Eschatology* (The University of New Mexico Bulletin, Anthropological Series, Vol. 4, no. 1, 1942), pp. 22–40.

should be thankful that their relatives were returning. "Old Manuelito, of Fort Sumner time, was the chief unbeliever. He said, 'It is our belief that if ghosts appear it is bad luck. If they do appear we will have to get rid of them.' I was living close to Manuelito so I did not believe in their return, but everyone was talking so strongly about it it was hard not to believe. A woman dreamed that in the future the ghosts would return to the land of the living. That seems to have been the start of it. Manuelito told all the leading men to try and discourage this ghost business. He said, 'We know that ghosts are bad.' He tried to get the people to think of beneficial things, like agriculture and sheep raising. He said, 'Why ask the ghosts to come back; some day you will get a chance to go there.' This ghost dance never caused any harm but this witch business did. Right after [the captivity at] Fort Sumner the Navaho were very poor."

Grey Hair, White Cone, Ariz.: "The people who were saying this were a kind of prophet people. After they had said this thing a number of girls and boys around eighteen years of age died." The informant says that he has heard this prediction of the return of the dead three times during his life. "The first time was when I was about twleve years old [1870]. I heard it again when I was about thirty years old [1890]. The last time I heard it was about fifteen years ago [about 1918]. These prophet men were thinking bad. They must have been thinking that all the Navaho were going to die. A few years after the first time I heard this [1870] there was an epidemic of measles and a great many people died. A few years after the second time [1890] an epidemic of mumps killed a great number of people. Nothing has happened as yet since the last prophecy but I am waiting to see what will."

Slim Curley, Crystal, Ariz.: "I was living at Lukachukai. I was a young man at the time. The days were just hazy and the sun was reddish. Everything looked peculiar. People began to say that the Utes and the Paiutes were talking about the ghosts coming. Many of the people in the country did not believe this. You could tell because they ridiculed the idea. However, there were a number who did believe it. I remember at a gathering for gambling one night there was a man who did not believe it. This man asked another for some money, saying, 'I hear that the ghosts are coming back to this country. No doubt my mother is in the crowd and you can have intercourse with her when she returns.' Those who believed said, 'The Utes are sending word ahead that the ghosts are coming.' In the last month Chi Dodge was giving a group of medicine men a talking to. In the course of the talk he said, 'You must not start all these rumors.' He said, 'Look what happened after Fort Sumner [days]; someone started this rumor that all the white men were to be exterminated and then later this business about the ghosts coming back was started.' One old man wanted to take a party to the west to visit Changing Woman and find out what this return of the ghosts meant."

Mr. Headman, Head Springs, Ariz.: "There were Holy Men among the Navaho who told the old men and women that the dead were coming back. However, the old men and women did not believe it. They said, 'No one is going to come back once they are dead. If they come back it will mean that they will bring back all kinds of sickness. Also, if they come back there will be no rains and no corn.' They told the prophets that they should not say that the dead were coming back. The prophets said, 'When the ghosts come back all the whites . . .' It hurts an old man like me to say these kind of words [i.e., to talk about ghosts]."

Albert G. Sandoval, Lukachukai, Ariz.: "It was known all over the reservation but most of the people did not believe it. They never danced. The Gods have left the country and have visited the people for the last time. The dead do not come back. In 1920 a preacher on the San Juan predicted a flood. The people were frightened and the majority of them left for the mountains. There was a hell of a mess. Most of the Indians took all their possessions with them. The knowledge [of the Ghost dance] does not seem to have come from any particular source. Everyone knew of it but it just seems to have been passed along."

Pete Price, Fort Defiance, Ariz.: "The wind and the weather were very unusual at that time. Then word came that the dead were coming back to the earth. However, the majority of the people did not take this very seriously. They used to joke about it."

Mr. Left-Handed, Crown Point, N.M.: "I heard that all the Navaho who had died at Fort Sumner and all those who had been killed by enemies were coming back to life. The Navaho were all to go back where they had been living before and all the whites would have to go back to their own country. This came from around Tohatchi. There was no dance connected with the coming of the ghosts. As a rule it was not believed by the majority. Most of the people thought that this was started by the witches."

The Late Little Smith's Son, Crown Point, N. M.: "When we first heard of it I was living along Tohatchi flat. We heard that the ghosts were moving in close to where we were. Some of the young scouts told me that my father was coming back and that I had better go over and meet him. They said that all those who did not believe that the ghosts were coming back were going to die; the rest of the people would live on. This ghost business started up near Shiprock. A man there started it."

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JEAN BASSET JOHNSON (1916–1944)

By ROBERT H. LOWIE

AMONG the regrettable war casualties must be registered the death of Lieut. (j.g.) Jean Basset Johnson, who passed away on April 4, 1944, as a result of an automobile accident in Tunisia.

Johnson was born in Moscow, Idaho, on September 7, 1916. After attending the San Diego Army and Navy Academy and the Students' Home, Corning, he entered the University of California, where he majored in anthropology, graduating in 1937. It was characteristic of him that as an undergraduate he avoided narrow specialization, roaming over a large field of knowledge, which included the Arabic and Ancient Egyptian as well as other recondite languages. After his baccalaureate he spent considerable time doing field work in Mexico, where he visited the Mazatec (1937), Yaqui (1939–40), Pima, Opata, Varohio (1940). He had several years' graduate work in anthropology at Berkeley and was looking forward to preparing a dissertation and ultimately taking his doctor's degree there when the War deflected him into the U. S. Naval Reserve (Communications). His duties took him to New Caledonia, and after some additional training to North Africa.

Johnson had an extremely engaging personality and with his nimble mentality was excellent company. When he was present, no host need worry about a dull party. He picked up a practical knowledge of languages with considerable ease and, possibly under the stimulus of his father-in-law, Mr. R. Weitlaner of Mexico City, devoted most of his energies to a study of Mexican Indian linguistics. He wielded a facile pen and would certainly have been a productive investigator in his chosen field. Those who knew him will remember him with fondness and regret.

BIBLIOGRAPHY

1937. *The Allelujahs: A Religious Cult in Northern New Mexico* (The Southwestern Review, vol. 22, no. 2. Dallas, 1937, pp. 131–139.

1939. *Un Cuento Mazateco-Popoloca*, with I. W. Johnson (Revista Mexicana de Estudios Antropológicos, vol. 3, no. 3, Mexico, 1939), pp. 217–226.

1939. *The Elements of Mazatec Witchcraft* (Ethnological Studies No. 9, Gothenburg, 1939), pp. 128–150. Reviewed in: JAFL 54, No. 211–212, 1941.

1939. *Some Notes on the Mazatec* (Revista Mexicana de Estudios Antropológicos, vol. 3, no. 2, Mexico, 1939), pp. 142–156.

1939. *Oaxaca Market* (Southwestern Review, vol. 24, no. 3, Dallas, 1939), pp. 333–339.

1939. Review of Radin: *An Historical Legend of the Zapotec*, in JAFL, vol. 52, no. 204 (with R. J. Weitlaner).

1939. Review of Bevan: *The Chinantec*, in AMERICAN ANTHROPOLOGIST, vol. 41, no. 2, pp. 319–320, 1939.

1940. *Three Mexican Tar-Babies* (JAFL 54, nos. 208–209, 1940), pp. 215–217.

1904. *Sonora Dance Regalia* (El Mexico Antiguo, vol. 5, nos. 1–2, Mexico, 1940), pp. 54–56.

1940. *Note on the Discovery of Teonanacatl* (AMERICAN ANTHROPOLOGIST, vol. 42, no. 3, 1940), pp. 549–550.

1940. *The Piman Foot Drum and Fertility Rites* (El Mexico Antiguo, vol. 5, nos. 3–5, Mexico, 1940). pp. 140–141.

1940. Review of Beuchel: *A Grammar of Lakota* (AMERICAN ANTHROPOLOGIST, vol. 42, no. 3, 1940), p. 504.

1941. Review of "Pascua: A Yaqui Village in Sonora" (Spicer), in JAFL 54, nos. 213–214, 1941, pp. 228–230.

1942. *The Huapango: A Mexican Song Contest* (California Folklore Quarterly, vol. 1, no. 3, 1942), pp. 233–244.

1942. *A Clear Case of Linguistic Acculturation* (AMERICAN ANTHROPOLOGIST, vol. 45, no. 3, 1943).

The Opata: An Inland Tribe of Sonora (Museum of the American Indian, Heye Foundation. In Press, 1942).

El Idioma Yaqui. Gramatica, Textos y Diccionario (Ready for publication).

BOOK REVIEWS

NORTH AMERICA

The Pre-Iroquoian Occupations of New York State. WILLIAM AUGUSTUS RITCHIE. (Rochester Museum Memoir, No. 1. xvii, 416 pp., 165 pls. 6 figs. Rochester Museum of Arts and Sciences, Rochester, N.Y. 1944.)

The history of archeology in New York State is marked by a long series of splendid publications which stand as a record of untiring, honest and fruitful labor. Another feature of this literature is that it has been completely and searchingly summarized, once in Arthur C. Parker's monumental *Archaeological History of New York* (1922) and a second time by the formidable volume which is the subject of this review. It is significant to note that the continuity of all this effort has been preserved for a period of more than fifty years. Ritchie's most recent work is obviously the result of his indefatigable zeal but his success has depended in large measure upon the support of Dr. Parker, Director of the Rochester Museum of Arts and Sciences.

Ritchie sets the stage for his discussion of *The Pre-Iroquoian Occupations of New York State* by briefly reviewing and correlating the more significant ideas of his predecessors with contemporary opinions. Following this, he reviews the early history and ethnology of the Iroquois and some Algonkian speaking tribes. The descriptions of the culture of Algonkian tribes include features which were also characteristic of Iroquoian tribes and, furthermore, the distribution, in North America, of such traits as exogamy, polygyny, house types, various types of artifacts, types of political organization and such are indications that in modern times the culture of the aborigines was a composite one. In following Ritchie's study back to some of the earlier "congeries," "configurations," or whatever they may be, the mixture of cultures of different origins at different times is one of the salient characteristics of all the various units which have been segregated and "classified." In view of the subject of the book it is not fair to criticize Ritchie too harshly for not going more deeply into the documents. However, as the present description stands it is largely a reprint of details which are fairly well known.

The data on the "Pre-Iroquoian Occupation" is analyzed in an order dictated by Ritchie's method of applying the McKern Classification. Furthermore the author has arranged the various categories in a sequence which is justifiable on the chronological grounds which he presents. After the briefest review of Iroquois archeology he begins with the Owasco Aspect of the Woodland Pattern and, in so far as is practical, works backward in time through the Coastal and Vine Valley Aspects. Following this there is an account of the Hopewellian manifestations and the Orient Focus. Final descriptions present the various categories into which he has divided his Archaic Pattern. The last two chapters in the book are entitled, *Salient Unsolved Problems of New York Archaeology* and *Comparisons and Conclusions*. There is an index and an excellent bibliography.

We may omit a complete summary of the data which Ritchie has supplied; for, with important exceptions, this material has already been published and some of the reports on the field work have been reviewed. The latest prehistoric material is classified as the Owasco Aspect, Northeastern Phase, Woodland Pattern and this is divided into two Foci, Castle Creek and Canandaigua. The composition of these categories differs only in a few details from earlier classifications. Ritchie has added material discovered on a

number of new sites, descriptions of some of which have been published by other authors. During its late manifestations the Owasco Aspect appears to be contemporaneous with Iroquoian. Furthermore the present description does tend to emphasize the relationship between Owasco, particularly the Castle Creek Focus, and Iroquois material to a degree which Ritchie's reluctant recognition belies. Such a "mixed" condition, if in this case it actually is such, in culture development is embarrassing to anyone who insists upon rigid classification.

The description and discussion of the Coastal Aspect is an important addition to our knowledge, for this category has been developed by the re-analysis of data published by several authors and combined with material which reaches the printed page for the first time. The author correctly notes that much additional work remains to be done. Ritchie divides the Aspect into the Early Focus and Late Focus. The former, he surmises, has typological resemblances to the Laurentian material and the latter to Owasco which had been "energized by Iroquois influence."

One of the significant contributions of the book is Ritchie's definition and discussion of the Vine Valley Aspect. Here is provided a wealth of information which is a collation of older data and a number of more recent discoveries. Ritchie is perplexed by the material which, he says, "has been a baffling enigma whose intricate nature is reflected in the uncertainties and contradictions of all workers in the northeast who have tried to cope with it." Nevertheless he proceeds with an eighty-nine page description and classification of what may eventually emerge as one of the significant cultural developments in the region. The largest proportion of the Vine Valley material has been found in burials. Habitation sites are rare but, in this reviewer's opinion, of vital significance for they may hold the key to the placing of this material in its proper historical position. The "diagnostics" of the Vine Valley Aspect (cf. p. 115) and the long list of traits ascribed to the Point Peninsula and Middlesex Foci comprise a catalogue of items which, in view of implications of relationships with cultures in neighboring regions and in time and space, troubles the classifier. It is noted that some traits which are diagnostic of the Vine Valley are also diagnostic of, or at least present in, other categories of the Woodland Pattern, the Hopewellian (which Ritchie is unwilling to classify fully) as well as Adena, Intrusive Mound and such. As the account proceeds, the attempt at classification, which constitutes what might be called discussion or interpretation, leads the author (and the reader) through a maze of verbiage.

In Ritchie's preoccupation with specimens, and the arbitrary combination of them, it does seem that he has missed a feature of the Vine Valley which has all-important implications. It is well known that sections of material culture connected with the ceremonial life of a community can be profoundly modified and that such events do not necessarily result in radical changes in other parts of the culture. If one considers the Vine Valley material in this light, the list of artifacts related to subsistence become significant "diagnostics" and the burial complex can be considered as a development grafted on to the basic culture. An hypothetical approach such as this permits the postulation of an understandable relationship to general developments in the region and to the cultures diffusing into the region from various sources. It seems to me that what Ritchie has called an enigma has been made even more obscure and incomprehensible by the method employed to clarify it. With some modifications, which space prevents including here, these impressions apply to the author's treatment of the Hopewellian Phase of New York.

The discussion of the Archaic Pattern marks an important expansion of Ritchie's views concerning a mass of data for which he postulates varying degrees of interrelationship. This material is found over a large geographic area and may have existed over a long span of years. A wide variety of artifacts are assigned to the Foci and Aspects in this Pattern and, on the basis of the resulting classification, plus stratigraphic position, the author constructs an hypothesis which accounts for geographic distribution and diffusion, as well as for the temporal position of the several units. Of necessity this whole structure depends upon the field data and this is not always as precise as Ritchie appears to assume. Furthermore the general process involves the manipulation of arbitrarily selected types of artifacts. The structure has considerable merit but since it is the result of an empirically imposed scheme it lacks the authority which an hypothesis developed by more strictly inductive methods would carry.

It is possible to accept the idea that there were in the east groups of people who utilized a variety of artifact types, such as those ascribed to the Archaic Pattern. Within the limitations imposed by geography and culture history, some of these appear in the Laurentian Aspect. However there are valid objections to the comprehensive explanation offered in this study. "In conclusion," Ritchie says on p. 259, "it may be emphasized that sufficient data have been accumulated, principally with respect to the distribution of the stone gouge and the ground slate point and ulo, to indicate the northeastern provenience of the Laurentian Aspect, for which they are diagnostic markers." In following the argument through one finds that any other artifact which can in any way be associated with these "diagnostic markers" is included in the Laurentian or related to it in some way. Furthermore, various divisions of the Laurentian are established by a rearrangement of these associated artifacts. Once this is done, there is formulated a series of sweeping hypotheses, including the diffusion of culture southward from the far north and northeast and trains of diffusion from west to east. This is cleverly done and it is the result of an untold amount of hard labor. If one stops to assess the results and to compare such with the quantity, quality, geography and chronology of the data so analyzed, it is difficult to see what it means in terms of culture history. Most prominent in the whole scheme is the segregation of culture traits into units, some of which are considered important and some not. Sometimes such segregation isolates a few tools even from a single stratum. Interpretation of culture history on this basis amounts to a consideration of disparate sections. It would be more convincing if, instead of segregation, emphasis were placed upon correspondences so that the whole of a culture complex was considered instead of specialized parts.

By means of this intellectual exercise Ritchie has, with some reservations, included in the Laurentian the "Red Paint" culture of Maine, the specimens found at Tadoussac and also collections from several sites in Labrador. It is interesting to note that no ulos have been found in the "Red Paint"; one from Labrador is of the chipped variety and may even be an assymetrical knife blade, a second specimen, reputed to be an ulo, may have been used but it is an unworked, unpolished piece of stone in its natural form; at Tadoussac none were found. Ground slate "bayonet" points are a significant characteristic of the "Red Paint." None were found in Labrador; the specimens from Tadoussac are probably of different type; and, in New York, they are extremely rare and fragmentary. Gouges are very nearly in the same category, for their greatest development

is seen in the "Red Paint." One broken and badly eroded specimen was found in Labrador. New York State gouges are not numerous, relative to the "Red Paint," and the only types which are also common to "Red Paint" are, apparently, generalized types which have a much wider distribution and possibly association than is considered in the argument. The specialized New York types, e.g. "Vosberg," apparently are distributed over a different area. Further analysis of this sort leaves an impression that actually it is only possible to formulate for the whole area extremely generalized statements to the effect that in the northeast notched and stemmed arrowpoints, celts, gouges and adzes were made. Classification of culture complexes beyond this point cannot be done satisfactorily except within certain geographic limits. The Brewerton, Vergennes, and Vosburg Foci, and, to a lesser extent, the Blue Hill (?) appear as identifiable units and an acceptable general relationship, if typological similarity means relationship, appears to exist in the case of the first three. The status of these three in relation to Blue Hill, Tadoussac and Labrador appears to be far more generalized, at least on the basis of present information, than Ritchie would have us believe. The discussion which postulates a relationship between the Dorset culture and the Laurentian is a wholly inadequate and one-sided presentation of one of the more difficult and certainly provocative problems in northern North America.

In this review no mention has been made of chronology. Some of the categories of the Laurentian may be old; they appear to have existed in a period the latter part of which saw the introduction of pottery. We have no knowledge of the age of "Red Paint," Tadoussac, or the Labrador sites. It is of significance to note that, in addition to features which are presumably old, the collections from these latter sites include types which were used in late protohistoric times. It is not yet acceptable to hold, for purposes of establishing a sequence of cultures, that types found in late deposits are simply continuations of a tradition. It may be added that there are a number of features in the "Red Paint" which might be interpreted as something else beside Laurentian. What would happen to Ritchie's classification if some of the far eastern material which he considers to be Laurentian should be associated with types which might be traced to Adena, or even Hopewell? Before his classification is acceptable, even as a working hypothesis, all such possibilities should be given some consideration.

In summary, it seems to this reviewer that the Laurentian Aspect would have been a more useful tool had the author confined his discussion of it to the manifestations which can be shown to have some acceptable relationship. In its present form it has been used as a catch-all for much which, at present, is simply unexplainable in the east. The whole structure is largely the result of the devotion to method rather than a preoccupation with culture as an expression of human existence. Furthermore his classification depends upon that section of the method which is concerned with "diagnostic traits." It is difficult to understand how arbitrarily selected, specialized types of artifacts which occur in small numbers, and sometimes not at all, can be of great significance in establishing basic cultural relationships between units which are also found to possess a number of traits which are not comparable. Furthermore, when chains of these diagnostics, beginning with one set of types and ending with another, are used to indicate wide geographic distributions of nuclei it seems to me that the system is carried beyond the limits of credulity.

In one site, Frontenac Island, Ritchie finds "no physical stratigraphy, but two oc-

cupational zones distinguished by content" (p. 273). He concludes, " . . . the sundry and rather ample data on the Frontenac station evidently connote two superimposed components separated by an indeterminable time span, the superior level apparently referrable to the Point Peninsula Focus and probably contemporaneous with the Vinette site, the older horizon a composite manifestation of the Lamoka and Brewerton foci, plus significant traits not known for either" (p. 287). Ritchie is probably right about this. The extremely complicated situation is not easy to analyze and Ritchie's style of writing increases the difficulties of comprehension. However the mixture of culture in the lower stratum seems to be acceptable. It should be noted that even though this is an extremely important site it is still but one and the conclusions must be treated with caution. The location of the site upon a small island is also significant for, apparently nowhere was it possible to reach an undisturbed edge of the deposit. The separation of the two layers is thus established on the basis of an incomplete profile plus deductions based on the classification of material from other sites. It is expected that Ritchie will eventually discover other sites which will substantiate his hypothesis but for the moment we must recognize the possibility that Point Peninsula followed closely upon a mixed Brewerton-Lamoka horizon.

The types of artifacts in the Lamoka Focus "argue for the limited nomadism of a hunting-fishing-collecting people" (p. 296). The data from the Frontenac Island site is evidence of the "partial coevality for the Brewerton and Lamoka Foci . . . ; but stratigraphic proof of the priority of either is still wanting" (p. 292). Because more "Lamoka" material has been found in western New York than in the east Ritchie postulates a route of migration "eastward from the Niagara Peninsula." The distribution of types extends the area formerly occupied along the "Susquehanna River well down into Pennsylvania, as well as about the source of the Genesee river . . . " A summary of the material included in the Lamoka Focus includes that which was first published and accounts of a few more recently discovered sites.

A feature of the book is the method which has been rigorously employed in an attempt to impose some order on the material brought to light. This is a full dress performance of the McKern Classification and Ritchie has brought into play practically every feature of the system which has ever been invented. In order to comprehend the full import of what the author is trying to say a careful reader has to sweat definitions of the classificatory jargon out of Ritchie's long, involved and rarely clear explanatory statements. It seems that almost every time this Classification has been used in the manner exemplified by this book it has been refined or modified to meet the exigencies of the moment. Ritchie has continued this procedure. In view of this, the author would have greatly aided the reader had he devoted a section of his book to a discussion of method.

Ritchie's use of the classification has brought out some of its advantages. One of the most important is that within definite limits it is an efficient method of arranging data so that it may be more easily comprehended. The Brewerton Focus, the Lamoka Focus and others appear as categories which, within themselves, are describable units and any reader can understand what is meant by them. Difficulty with the classificatory system is encountered in each case where the culture which forms part of some category has been modified by diffusion or even by internal evolution. In such cases the necessity for classification prevents the portraying of the amorphous character of culture.

As one watches the author strive valiantly to force the information he has brought

together into the classificatory framework, one is struck with the rigidity of the result. The material with which archeologists have to deal is the result of human thought and action and such are extremely sensitive to all sorts of stimuli. The very information which Ritchie presents is ample evidence that a host of such stimuli must have been present in the east. The population was composed of a somewhat unstable mixture of several basic racial strains. The distribution of wholly unexpected culture traits may indicate that the fundamental cultures of the region included also the rag, tag and bobtail of practically every important development which occurred east of the Rockies. This condition existed in a complex geographic region and over a long period of time. Inevitably culture modifications took place in all sorts of ways and for all kinds of reasons. The occurrence of a few types of "foreign" artifacts in a stratum can well indicate a delicate contact between several culture complexes and such is completely obscured by the brutality of the Classification. The continuity, changes and gradual evolution of culture in the northeast will never be fully brought out by any such a system as Ritchie has employed. However, the minor categories which he has developed are essential and they will be a great aid if their limitations are fully recognized. Beyond this we must depend upon an approach which is inductive and at the same time flexible enough to allow for frailties of the human intellect.

Culture classifiers will raise violent objections to the above comment and inevitably these will lead into theoretical, in fact philosophical, discussion of the ends and aims of archeology. Are we interested only in the specimens and should we limit our endeavors to fitting them into a three dimensional picture puzzle? Or, on the other hand, are we interested in the artifacts as symbols of the existence of human beings? Ritchie's treatment of the material falls largely within the limits of the first query. However, there are signs that he has some ideas concerning the vitality of the cultural data and we may hope that these will grow and come forth in a companion volume.

In summing up this over-long review, the general character of the preceding remarks should be pointed out. In general I have criticized somewhat harshly the method which has been employed. Such criticism is controversial, for this method has been widely accepted by many archeologists. The principle point is that to me, and I am but a single reader, Ritchie's book lacks any feeling for the people who were responsible for the objects with which he is preoccupied. Only a period of use will show whether this is an advantage or not. One thing is certain, Ritchie has gathered together a tremendous mass of material and, regardless of any consideration, this has been organized into a structure which can eventually be understood. For this reason, if for no other, the book is an extremely important document which no archeologist interested in the eastern half of the continent can ignore. Furthermore the book contains the germs of the author's ideas concerning a wealth of material with which he alone is as intimately familiar. Perhaps most important is the fact that Ritchie has had the courage to set down ideas which are extremely controversial. He has done this with the certain knowledge that much of what he has had to say will be the occasion of considerable discussion. Such will inevitably mark a period of unprecedented progress in northeastern archeology.

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Yokuts Language of California. STANLEY NEWMAN. (Viking Fund Publications in Anthropology 2. 247 pp. New York, 1944.)

Not the least interesting result of Newman's Yokuts monograph is that it illustrates remarkably well the notable progress made in American Indian linguistics during the past forty years. Newman, a student of the late Edward Sapir, collected his data on Yokuts in 1930–31 and completed (in its basic essentials) the present work in 1936 as his doctoral dissertation at Yale University. As a contrast we have A. L. Kroeber's *The Yokuts Language of South Central California*, based upon field data collected between 1900 and 1904, and published in 1907.[1] A comparison of the two monographs brings into sharp relief the advantages of the phonemic method employed by Newman to describe the complex system of vowel change and vowel harmony which accompanies every morphological change in all the Yokuts languages. This does not mean, of course, that Kroeber's data—or by implication, the work of any of the linguists of the earlier period—is thereby completely superseded. Newman himself points out: "The Yokuts dialect divisions established by Kroeber are borne out by the more detailed structural evidence of the six dialects represented in this grammar. Kroeber's material includes a wider range of dialects than my own, for many of the dialects which he covered in his field study of 1900–04 had disappeared by the time my field work began, some thirty years later. His monograph remains, therefore, as a most valuable source of comparative data for the Yokuts dialects" (pp. 5–6).

It would be a difficult task to summarize adequately the tremendous mass of material included in Newman's work. Every paragraph of his description is so compactly written as to defy further reduction. Despite this rigid economy of space and a complicated system of nomenclature and abbreviation, which often makes it a difficult task for the reader to work out the meanings intended by the author, the numerous examples illustrating each rule and generalization make it possible for the reader to amplify and check them. To make this procedure less painful, however, the present reviewer recommends as a helpful preliminary the excellently written and more general survey of Yokuts morphology and syntax to be found in an earlier publication of the author.[2]

Easily the most important feature of Yokuts phonology is its complex system of vowel change and vowel harmony. Newman recognizes ten vowel phonemes. Seven of these occur in bases, the theoretical roots underlying the word stems derived from them; the remaining three are found only in derived forms. But the seven vowels occurring in bases are patterned into eight morphophonemes and Newman departs from a strictly phonemic orthography to represent by distinct symbols the two morphophonemes of one of the seven vowels. Root vowels occur in pairs, each base having two and only two vowels. The six base types are each varied by means of a regular but highly complicated system of "dynamic vowel changes" into twelve or more phonetically distinctive stems. Each stem class has its peculiar suffixes, some of which make the stem into a word and

[1] University of California Publications in American Archaeology and Thenology, No. 2, No. 3, 1907.

[2] A. H. Gayton and Stanley S. Newman, *Yokuts and Western Mono Myths* (Anthropological Records, Vol. 5, No. 1. University of California, 1940).

others which transform it to a theme, which is then completed by another suffix. Adding a suffix to either a stem or theme results in another series of vowel changes, largely mechanical in nature and affecting both the radical element (i.e., stem or theme) and the suffix itself. The author says: "An instructive exercise that I indulged in during my Yokuts field work was to construct words having four or five suffixes and to ask the informant for a translation. Although such words complied with the grammatical rules and could be translated by my informant without any difficulty, they seldom failed to provoke his amusement. It was obvious that these words were impossibly heavy and elaborate. To the Yokuts feeling for simplicity they were grammatical monstrosities."[3]

The principal grammatical processes are vocalic change and suffixation; reduplication and proclisis, the two other techniques of morphological change, occur but rarely. To quote again: "The suffixes of Yokuts have more the character of algebraic symbols; their content is schematic rather than material. Among the verb suffixes, for example, are those defining an event as durative, continuative, repetitive, causative, reciprocal, passive, subordinate, undifferentiated past or present, future. The most common noun suffixes refer to case relations, marking the subject, direct object, and indirect object, or denoting possession, location, and the like. Particularized and concrete meanings are not expressed through the suffixes in Yokuts.

"Even the stems, which are the only elements in Yokuts that can specify the material details of reference, show a strong tendency to carve out broad and comprehensive meaning from the referential field. The vocabulary of verb stems is largely made up of such diffuse and generalized notions as 'come,' 'go,' 'walk,' 'run,' 'hear,' 'see,' 'smell.' When suffixes with their abstract meanings are joined to stems whose referential content is so inclusive, the resulting words contain notions that are generalized."[4]

The author confines his attention in the monograph under review to the six remaining Yokuts dialects. Though his primary emphasis is upon the synchronic description of features common to all of the languages concerned, he has not neglected the comparative and historical aspect. However, he makes no attempt to relate Yokuts to any other of the languages of the so-called Penutian stock. It is to be hoped that he will shortly publish detailed lexical materials on Yokuts so that data will be available toward a solution of the long debated Penutian problem.

Mention should also be made of the Viking Fund, the publishers of this volume, who are new to the field of anthropological publication. This book, by reason of the painstaking care that has so obviously been taken to produce a well designed and wholly accurate typographical job, will be welcomed by linguists in the American field, who often find it difficult and expensive to get their works into print. Dr. C. B. Osgood, the editor of the new series, is to be congratulated on this and others of the publications sponsored by the Fund. May the Viking Fund continue to give linguistic monographs a prominent place on their lists.

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[3] Gayton and Newman, *op. cit.*, p. 5.

[4] Gayton and Newman, *op. cit.*, pp. 5–6.

The Ten'a Food Quest. ROBERT J. SULLIVAN, S.J. (Anthropological Series, Catholic University of America, No. 11. xii, 142 pp. 1 fig., 2 pls. $1.60. Washington, D. C.: Catholic University of America Press, 1942.)

In this monograph, Dr. Sullivan has chosen as his purpose "to form a living picture of the Ten'a, to view this one element, the food quest, in its proper setting, and to examine it fully, as we find it associated with other aspects of their culture" (p. v.) The Ten'a of whom he writes are the Athapaskan Indians of the villages of Koyukuk, Nulato, and Kaltag on the lower Yukon River, Alaska, or in other terms, those people of the Koyukon group nearest to the Ingalik living below them, on the Yukon. The data were derived from first hand contact with the Indians during residence in the country between June 1936 and January 1937 with occasional information and leads from the voluminous manuscripts of the late Rev. Julius Jetté, which were then deposited in the Mission Station at Nulato.

The account is to a considerable degree a visual description of what Sullivan saw of the modern food quest during the two native seasons, summer and winter. He definitely attains his "living picture" when he visits a summer fish camp or goes on a duck hunting trip. His story of the killing of a moose (pp. 69–75) is as full of information as it is of life. Before we have followed the yearly round to its springtime end, we have also considerable material on many aspects of culture.

Sullivan's picture is not completely modern, however, for he sometimes jumps back in time to the aboriginal scene. Here the Athapaskanist will feel deprived for not sharing a knowledge of the manuscripts of Jetté, which certainly should be published if the praise given them is deserved. A mixture of Jetté and Sullivan makes an unsatisfactory account, and the latter shows bias in his emphasis of an aboriginal belief in the concept of a Supreme Being. Also, comments on the same Indians by early writers might have been used to advantage but the lack of any bibliography leaves at least a question as to what sources the author knows.

In the matter of comparative data, the picture is not confused by references to other Indians. It may be noted here, however, that the detailed data on the aboriginal material culture and fishing customs (as well as the modern ones, as might be expected) are generally almost identical with those of the Anvik-Shageluk division of the Ingalik. This is a significant check on the exactness of the data from both groups, for the Ingalik material was not available to Sullivan during the time of his study. Rabbitskin weaving and the possibly greater importance of the moose are two of the few differences noted. It is real praise that after years of work on Northern Athapaskan culture, the reviewer feels a strong desire to check only two items in Sullivan's account of the Ten'a acquisition of food. One is the normal use of split willow line (instead of spruce root line) in tying fish trap sticks (pp. 63–64) and the other is the account of killing a loche by "striking a sharp blow on the ice just over its head" (p. 65). This last sounds like a fish story even if true.

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Contributions to American Anthropology and History (Vol. 7, Nos. 35–39. 292 pp. Carnegie Institution of Washington, 1942.)

This volume contains: No. 35. *Late Ceramic Horizons at Benque Viejo, British Honduras*, J. ERIC S. THOMPSON; No. 36. *Maya Arithmetic*, J. ERIC S. THOMPSON: No. 37. *Substela Caches and Stela Foundations at Copan and Quirigua*, GUSTAV STROMSVIK; No. 38. *The Maya Calendar of the Ixil of Guatemala*, J. STEWARD LINCOLN; No. 39. *Rio Grande Glaze Paint Ware:* ANNA O. SHEPARD.

The first four papers are straightforward reports on research, archeological, historical and ethnographic. The fifth, Shepard's study of Rio Grande Glaze Paint wares, will be discussed at greater length than the others because of its broad methodological significance.

Thompson's report on the pottery of Group B, Benque Viejo, is a compact analysis of a site dug to check and tie in the results of investigations at several localities in the surrounding region: San José, Camp 6, and Mountain Cow, and to investigate connections of the British Honduran region with the Peten proper. The Benque Viejo ceramic column parallels that already established for the Peten-British Honduran region. The three earliest horizons, IA, IB, and II (so numbered to conform to the nomenclature established at Uaxactun), have not been stratigraphically determined, but are based on typologic evidence. Chief concern is with phases III and IV. Analysis of sherd lots, the relative chronology of which derives from association with superimposed constructional features, shows that Benque Viejo III material divides into two sub-phases; IIIA, which links with San José III and III-IV, and IIIB, connecting with Sane José late III-IV and part of IV. Phase IV at Benque Viejo appears to overlap San José IV slightly, carrying on part way through San José V. Connections with the Tepeu phase at Uaxactun are also close, except that, as in the case of comparisons with San José, two sub-phases at Benque Viejo correspond to three sub-phases at the major site. But for this difference, the Benque Viejo work serves to corroborate very neatly the ceramic sequences of the region, and provides some direct ties between Uaxactun, San José, and Mountain Cow, which reenforce the indirect connections previously determined. The only possible criticism that might be brought against the report is that, because only rim and significant base or shoulder sherds were counted, the samples of each type are extremely small (*vide* Table 1, colum "Totals"). Also, Thompson calculates his percentages of types on the basis of total sherds of that type, rather than percentage of total sherds of that level. As a result, the distribution table gives a picture of quantity of material excavated per level rather than a summary of the ceramic trends of each horizon. It is difficult, without recalculating the table, to see precisely how Benque Viejo IIIA and IIIB differ, as one might want to make detailed comparisons with some othr site of the same region.

Maya Arithmetic, by the same author, is a study of certain portions of the Dresden Codex, coupled with historic data and some interesting deductions from erroneous dates in inscriptions and codices, to determine the methods used by the Maya in their calendrical computations. The mathematical attainments of these folk have long been known, and are mentioned time after time in appraisals of the civilization level of Middle

America, despite our ignorance of the actual progress that the Maya had made from the mathematical point of view. Thompson summarizes his findings as follows:

"Maya mathematicians . . . probably calculated with counters, grains of maize, or beans, perhaps employing a simple abacus.

"Calculations in the Maya calendar can be made with great speed and accuracy with counters, using a year (here called the computing year) of 364 days, and its multiples.

"The layout of these tables and the arrangement of their accompanying signs strongly indicate that they were used in calculating the position of Maya dates. . . . "

Stromsvik's paper, *Substela Caches and Stela Foundations at Copan and Quirigua*, is, briefly, a systematic comparison of stela foundations and caches at these two sites with a résumé of available comparative data from other Mayan cities. The marked difference between the cruciform foundation in vogue at Copan and the simpler rubble-filled, stone-lined, socket-like pits used to support stelae at Quirigua and the even ruder foundation pits at other sites is pointed out as indicative of not only a difference in engineering skill but also a less direct affiliation of the "stela cults" of Copan and Quirigua than has been postulated.

The account of the Ixil calendar, edited by Thompson after Lincoln's death, is an important contribution to the field of Mayan epigraphy. It is through such source material as this that we may be able eventually to interpret properly our early, and often vague, historical data, and to clarify certain archeological problems. Those interested in culture processes as well should find raw material for their studies in these instances of elaborate ritualistic complexes functioning correctly despite four centuries of domination by an alien culture. A detailed résumé cannot be given here, but it may be said that the Ixil calendar seems to be in some respects the best preserved yet known among modern Maya.

The Study of Rio Grande Glaze Paint Ware is significant on two counts: first, for the importance of its findings to the understanding of cultural developments during the latest prehistoric Pueblo period; and second, of much broader importance, as a signal contribution to archeological methodology. The history of modern archeology can be summarized as a steady, if at times painful, evolution from an art to a science. The days when the prime aim of excavation was to loot sites of *objets d'art*, and when archeological reports consisted solely of "identifications" of deities and recitals of the hardships endured in the field are, thank God, long since past; the modern demand for more precise field methods, accurate recording, meticulous laboratory techniques and objective presentation of data has been manifest for some time. Yet much remains to be done before archeology can be considered a proper science. One of the most serious deficiencies has been in the realm of laboratory techniques. It is just here that Miss Shepard has made one of the most outstanding contributions to the progress of the study. Ceramic technology, which she has developed, is the newest tool in the archeologist's kit. It is so new, however, that many of us have not appreciated its full value, nor have we understood the requirements for its successful application. This paper is written as a type case showing the results that can be obtained from ceramic technology, and describing the methods of work in sufficient detail to make clear the types and quantities of material and data necessary for technological analysis.

It is obvious that mineralogical identification of pottery temper, and analyses,

michrochemical and spectographic, of pigments, can, when supported by knowledge of regional geology, give one sort of information and only one: the probable place of manufacture of the ware of wares. Yet once this information is available for a number of sites over a geologically varied region, an amazing wealth of culturally significant results can be derived from it. Evidence of trade is one of the more obvious of these results. (Reference is not to random occurrences of stray sherds from half a world away, but to well established channels of exchange.) Miss Shepard's objective weighing of the evidence (pp. 182–196) shows the probability of large scale trade between villages and districts of the Glaze Paint area, which, as she points out (p. 182) and as Kidder emphasizes in his foreword to her report (p. i.) indicates exchange of an extent hitherto unsuspected in interpretations of Pueblo economy. The Galisted district is demonstrated to have been the probable source of the andesite-tempered pottery found throughout the Glaze Paint area, in slight quantity in outlying districts in the early Glaze Paint period, increasing in amount through Intermediate and Late Times. As a corollary appears a need for a revision of previous concepts of culture—centers of the region—a district that can be shown to have been a center of production over so long a time must be reckoned a culture focus of first magnitude, in the field of ceramics at least. Apparently, except for Nelson, previous investigators have given unduly cursory treatment to the Galisteo basin. Another achievement of the study of temper data is a redefinition of the boundaries of the Glaze Paint area. The Rio Arriba and Northern Pajarito districts, previously excluded from the area on the basis of lower relative frequency of Glaze Paint sherds as compared with that of Biscuit ware, are shown to have imported by part of their Glaze Paint wares, the remainder being locally made, containing tempering materials geologically peculiar to those districts.

Chronology, as Miss Shepard makes clear, is a problem whose solution is to be sought in stratigraphical excavation, not in technological studies, and is a question to which technology can contribute little (beyond assisting in defining the ware-types for comparisons of levels). However, the technologist may be in a position to determine the relative chronology of two or more approximately parallel ceramic columns where the problem is complicated by trade back and forth between centers. On the basis of her technological study, Miss Shepard points out that the course of development of Glaze Paint ware was not the same throughout the area (p. 173), and suggests as a working hypothesis that Glaze I Red originated in the Albuquerque district and from there spread to the north and south (p. 174). Galisteo potters presumably copies Glaze I Red for a short time only, soon developing Glaze I Yellow and then the other Intermediate wares (*loc. cit.*). In short, precise knowledge of source of the wares occurring in a region as determined by the ceramic technologist provides the archeologist with data pertinent to problems of all types, and permits a refinement and accuracy of results impossible to attain by the usual rough and ready classificatory methods.

A most valuable part of the report concerns the requirements of a sample of technologic study. Few of us have known up to now, Miss Shepard remarks (p. 226); "That the importance of sampling is not understood is demonstrated by the frequency with which requests are made for the analysis of a handful of 'representative sherds'." The sherd lot to be studied should, for best results, be both large and unselected; the sherds themselves sufficiently large and well preserved to show characteristics of style. For statistical purposes, samples of 300 to 500 sherds of the types to be studied would

ordinarily be adequate. An ideal sample, Miss Shepard believes, would be of the amounts and qualities just mentioned, from "stratigraphic tests which are large and tap undisturbed deposits" (p. 236), with the technologic and stylistic analyses correlated to arrive at the most accurate classification possible.

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Contributions to American Anthropology and History, Vol. 8, Nos. 40 to 43. (Carnegie Institution of Washington, Publication 546, Washington, 1943.)

This volume contains four papers which were issued separately during 1943. The text is produced in the "offset" process; the many reproductions of photographs and drawings are of excellent quality. In the following each one of these important papers will be discussed separately.

No. 40. *The Archaeology of Southwestern Campeche*, E. Wyllys Andrews. pp. 1–100, 28 plates, 2 maps.

Because of its remoteness, and the climatic and many other difficulties involved in travelling in the region, Southwestern Campeche has long been a blank area on our archeological map. This has been so in spite of its being a rather critical area in regard to the movements of peoples and the flow of cultural influences between Mexico proper and the Yucatan Peninsula. The author of this report is therefore to be credited with courage and fortitude in attempting and carrying out a survey of the region and also with doing a good job of reporting.

Descriptions of about two dozen important sites are given, with plans of building arrangements for all those where such observations could be made without excavation. In general the emphasis is on architectural remains, there being only brief accounts of pottery and other artifacts. An attempt is made to place Southwestern Campeche materials into the general framework of Maya and Mexican archeology, and this constitutes a review of several aspects of the Maya field, in regard particularly to the Yucatan Peninsula. There are, for instance, chapters with the following titles: *The Ceramic Perspective; The Beam and Mortar Roof in the Maya Area, Problems of Dating*, and *The Correlation Problem.* All of these are valuable syntheses and include some materials from Yucatan not previously published. There is also a summary of the historical records of the Campeche area and a division of the area into five ecological zones.

No. 41. *Explorations in the Motagua Valley, Guatemala.* A. L. Smith and A. V. Kidder. pp. 101–182, 64 figures, including maps.

This report is an important addition to the basic source material on the archeology of the Maya. It records the survey and mapping of a large number of sites in the Middle Motagua Valley and some rather extensive excavations in one group of sites at Guaytan, apparently the most important center of what is called in this report the Middle Motagua Culture.

The authors divide the occupation of the Middle Motagua into two phases. The Lato Phase, the oldest, is seen to correlate in time with the Esperanza of Kaminaljuyu and the Tzakol of Uaxactun. The second phase which is called the Magdalena corresponds to the Tepeu Phase, but because of the presence of non-effigy Plumbate ware and copper it is thought to have lasted some fifty years longer than that phase in the central Peten, up to about the date 10.8.0.0.0. The architectural remains excavated included several pyramidal substructures, a long building consisting of two rows of

rooms, several richly furnished tombs with a peculiar type of roof structure, and two ball courts generally similar to those of Copan. No scuptured stelae have been found in the area, nor are the buildings as large or as formally arranged as in the Peten. Despite the nearness to Copan and Quirigua there was little apparent influence from the cultures of those centers. The ceramic relationships are seen to be closest to Highland Guatemala.

No. 42. *The Astronomical Tables of the Maya.* Maud Worcester Makemson. pp. 183–221, 1 figure, 17 tables.

This study is for the specialist in Maya calendrical studies, and this reviewer is incapable of adequately estimating its merits or significance. It deals with the astronomical tables on pages 51–58 of the Dresden Codex which are considered to be eclipse predictions. These are analysed in connection with modern astronomical data and in regard to the problem of the correlations of the Maya and Christian calendars.

No. 43. *The Mercado, Chichen Itza, Yucatan,* Karl Ruppert. pp. 223–260, 35 plates.

This is an extremely clear and compact account of the excavation and repair of the building at Chichen Itza known as the Mercado. In the thirty-five plates accompanied by a relatively short text, which does not unnecessarily repeat data easily seen in the drawings and photographs, all of the architectural details of the building can be readily grasped. Valuable in this regard also are two reconstruction drawings of the interior of the building by Tatiana Proskouriakoff.

The Mercado is a long building which fronts upon and partially closes the southern side of the Court of the Thousand Columns. The building consists of a gallery 180 feet in length, the vaulted roof of which was supported in front by eighty alternately round and square columns and by a wall in back. This vault is the broadest so far encountered in Maya buildings. Extending outward behind the center of this gallery is a square open patio with a sunken floor and surrounded by an ambulatory which is thought to have been covered with a thatch roof.The architectural style and the painted relief carvings on the door jambs and on a raised dias in the gallery indicate clearly that this building dates from the Mexican Period at Chichen Itza and was approximately contemporary with the Temple of the Warriors.

GORDON EKHOLM

AMERICAN MUSEUM OF NATURAL HISTORY

SOUTH AMERICA

Negroes in Brazil: A Study of Race Contact at Bahia. DONALD PIERSON. (xxviii, 392 pp. The University of Chicago Press, 1942.)

After reading Donald Pierson's book, one cannot help asking himself why the Brazilian Negro has been ignored so consistently by the students of inter-racial relations. The importance of Brazil as the largest country in Latin America and the size of its African population alone should have attracted the attention of North American and European scholars interested in race problems. Furthermore, the country is easily accessible to observers and field-workers and there exists a wealth of materials relative to its social history. What is more important, Brazil offers an almost unique example of Negro-white symbiosis with a minimum of prejudice and hostility. Whatever the reasons, this immensely interesting area has been bypassed by anthropologists and sociologists alike, and Donald Pierson's book published in 1942 fills a real gap.

Pierson's North American origins and sociological background have made him a particularly sensitive observer of Negro-white relations in Brazil. It is apparent throughout his book that the plight of the Negro in the United States is present in his mind and that he examines Brazilian social reality from an implicitly comparative point of view. Just as a psychiatrist is keenly aware of the most minute morbid traits in individual behavior, a sociologist, familiar with the pathology of Negro-white relations in the United States, is particularly well prepared to detect any symptoms of inter-racial tension elsewhere.

On the other hand, this comparative attitude of the author may be held responsible for his somewhat over-optimistic estimate of the inter-racial situation in Brazil. Because the Negro in Brazil is so much better off than his racial brother in the United States, Pierson is moved to confer upon the Brazilian society a clean bill of moral health in racial matters. In so far as one is engaged in passing judgments on different societies with regard to their treatment of minority groups it is preferable, I believe, to use absolute standards rather than to judge them comparatively.

One of the remarkable features of Pierson's book is that his reader is nowhere led to accept any conclusions without being given a chance to examine the supporting evidence. The book is replete with direct quotations, factual references and statistical charts. Furthermore, the author does not hesitate to furnish materials which weaken his own argument and provide ammunition against his own views. Thus, in discussing the learned *Congressos Afro-Brasileiros*, he states that, "generally absent is any concern with problems of racial conflict or accommodation, implying quite definitely the comparative absence of any race consciousness answering to them on the part of the Negro or any other ethnic group" (p. 206). And just a few pages later he quotes a Brazilian Negro, member of the Second Afro-Brazilian Congress, who accuses this organization of avoiding the racial issue. According to this Negro speaker, "the Afro-Brazilian Congress ought to point out how deplorable is the condition of the black man in Brazil. The Afro-Brazilian Congress ought to say to the black man that social lynching is worse than physical lynching, etc." (p. 223). As can be seen from this instance, the author does not stack up his cards in support of his point of view, but produces his evidence quite impartially.

Emphasis on direct quotations and on documentation makes *Negroes in Brazil* a difficult book to read. This difficulty is increased by an immoderate use of Brazilian Portuguese and Brazilian-African words and terms. They are translated into English wherever they occur for the first time in the text, but the average reader can be hardly expected to memorize them at once, and there is no glossary at the end of the volume to help him out. Some quotations are given in Portuguese only (pp. 119, 171), and, needless to say, very few readers will be able to understand those.

It is to be regretted that a book dealing with such an interesting and socially important topic is unlikely to reach beyond the narrow circle of social scientists. There is every reason to encourage interest in Brazilian social life and to make known the Brazilian pattern of Negro-white accommodation. The substance of the book could be easily freed from some of its academic paraphernalia and thereby be made accessible to a wider public.

Donald Pierson's main thesis is that Brazil is a multiracial class society characterized by the usual economic and social inequality, but free from social stratification

based on race. Since slavery was abolished in Brazil as late as 1888, the bulk of the Negro population had a late start in the general race for material success; this accounts for the fact that there is a heavy proportion of Negroes among the lower economic classes. Otherwise, color *per se* is no obstacle to social and economic advancement, and, as the Brazilian saying goes, "a rich Negro is a white man, and a poor white man is a Negro." On the whole, Pierson's preoccupation with the concepts of "caste" and "class" with regard to Brazilian society, shifts the emphasis somewhat from a purely functional analysis to a structural diagnosis, which, in the reviewer's opinion, represents a regrettable deflection of attention from the complexity of social reality.

Pierson's book is introduced to the reader under the double title of *Negroes in Brazil. A Study of Race Contact at Bahia.* The author's research was focused on the old seaport of Bahia, but he did not always escape the temptation to generalize from his local fieldwork to Brazilian society as a whole. This tendency to see Brazil from the point of view of its Bahian *Middletown* should not be lost sight of by the reader of the book. Brazil is a land of great geographic, ethnic and cultural diversity, and for a general discussion of Negroes in Brazil one should have more data on Negro-white relations in such areas as Minas-Geraes, São Paulo and the capital of the nation.

As a pioneering work Donald Pierson's book is of tremendous value. A brief review cannot do justice to the richness of its content and to its methodological and analytical keenness. Suffice it to say that it belongs on the must list of every student of race relations.

JOSEPH BRAM

QUEENS COLLEGE

Archeological Explorations in the Cordillera Vilcabamba, Southeastern Peru. PAUL FEJOS. (Viking Fund, Publications in Anthropology, Number 3. 75 pp., Illus., New York, 1944.)

This condensed and beautifully illustrated monograph presents valuable basic information concerning six major and several smaller Inca ruins in the steep Andean ranges east of the famous ruin of Machu Picchu. Because no other pure Inca town had previously been carefully explored and reported on, Machu Picchu has long stood as a unique "type site." The present large scale surface exploration combined with mapping and photography, now make available excellent photographs, ground plans and factual descriptions of six more ruins of similar Inca provenience, at least two of which, Wiñay Wayna and Inty Pata, have more extensive terrace systems than Machu Picchu. The Yale University—National Geographic Society expeditions of 1912 and 1915 first reported certain of these ruins. Others were not discovered, nor were any of them cleared, until 1940–41 when the members of the Wenner Grenn Scientific Expedition to Hispanic America carried on the extensive operations herein described.

The leader of this expedition and present author, Paul Fejos, lacking experienced archeologists on his staff, carefully and wisely refrained from sub-surface excavations. As a result the scientific world gained much additional knowledge concerning town-planning in Inca times and the way was made easy for qualified excavators who followed and others who will come later. The present author presents his facts with brevity and lucidity unburdened by those endless speculations which have too often comprised the larger portion of Andean archeological literature.

House groupings, stairways, roads, irrigation and terrace systems are all carefully described and illustrated. The almost unique combination of detailed maps, ground plans and oriented photographs permits a clear, rapid and graphic view of both major configuration and minor details. Despite many topographic and other variations all the ruins fall into the Inca pattern characterized by competent, and occasionally excellent, stone work, terracing and water control without any of the monumental structures or elaborations of stone sculpture which mark certain earlier periods. Paved plazas, ornamental baths, boulder shrines and rare ornamental façades occur, but the primary structures appear to be utilitarian in nature. The sites were apparently agricultural towns and the author, unlike numerous other investigators, finds no evidence suggesting that any of these sites (including Machu Picchu) served as border fortresses. At Phuyu Pata Marka and Cacha Bamba, which alone contain boulder shrines, plazas bordered with baths and other apparently ceremonial structures, religious concepts were emphasized. At Inty Pata and Wiñay Wayna the extensive agricultural terraces are most impressive. A few minor excavations carried on by John H. Rowe confirmed the surface evidence of Inca provenience since they yielded only Inca ceramics. New evidence concerning the vast system of roadways, staircases, bridges and, in one case, tunnels that connected sites is of great interest. The author doubts that all six towns were occupied at the same time but believes that the density of Inca population in the Cordillera Vilcabamba was probably then the greatest in Peru. From the relatively small number of rooms at most of these sites this seems to the reviewer a debatable point. Intensive ceramic and other detailed comparisons between these sites as well as with those in other regions can undoubtedly solve these and similar important problems.

It must be pointed out, however, that before such badly needed comparisons can be made we must have a vast amount of similar accurate cartographic material on nearly all other major ruins in Peru. It is astounding that concerning such a vast organized urban experiment as Chan Chan on the north coast there is not one adequate map available. Bandelier's map of Chan Chan exists in the files of the American Museum of Natural History but few have used it and its adequacy is untested. For many important ruins Squier's sketch maps are still the best obtainable despite so many known inaccuracies, and Uhle's maps of Pachacamac and other great sites, often without contours, have not yet been replaced. One can justly admire the vast labors of these lonely pioneers and at the same time be ashamed that in an age of aerial photography and mapping their work has so rarely been bettered. Peru apparently offers more opportunity for sociological interpretation of archeological data than any other New World area but until its major sites are adequately mapped and its culture sequences objectively determined, inductive methods of culture analysis will not replace outworn speculation. It is for this reason that the present brief but comprehensive and factual report assumes unusual significance.

WM. DUNCAN STRONG

COLUMBIA UNIVERSITY

OCEANIA

The Flight of the Chiefs. BUELL H. QUAIN. (248 pp. New York: J. J. Augustin, 1942.)

Flight of the Chiefs is a collection of songs and tales from Namuavoivoi on Vanua Levu, Fiji, recorded and translated by Buell Quain. The collection is unique. No one

interested in primitive literature can afford to miss this valuable folk anthology. The songs and stories have been grouped by the author according to their form of composition: true songs, serenades, dance songs, tales, stories, and animal stories. These are the native classifications, and each class can be identified by its characteristic style and delivery as well as by its composition. Furthermore, each type of song or story fits into its particular niche of Fijian life.

The author's introduction to the translations is brief but informative. Here the author attempts to place the songs and stories which follow in their cultural setting. He also outlines in satisfying detail his techniques of translation. Considerable confidence in the accuracy of Buell Quain's interpretations derives from the fact that he carried on his field work in the native language. Whenever he was unable to understand the obscure phrases which he heard, he requested his informants to act out in detail the event or situation to which the expressions referred. Songs and tales alike are literally riddled with footnotes, many of which contain valuable items of information on Fijian culture, not elsewhere published.

Translation of native texts, always difficult, is particularly so in the case of poetry and formal prose. Too reproduce the style, composition, and spirit of Fijian songs and stories, and at the same time to be as accurate as every anthropologist feels he must, is almost impossible. Fijian language is replete with allusions and nuances which defy immediate understanding to those who lack deep insight into Fijian culture. The author made a valient attempt to capture the spirit of the compositions which he translated; he faithfully strove to reproduce the native style and form; he combed the English language for words and phrases which would accurately represent the meanings of the original native text. In none of these respects did he succeed completely. Here and there are spirited passages; now and then the Fijian form and style is perfectly preserved; very often, the English words selected are the best that can be found. But none of the translations lives up to the ideals of presentation which the author set for himself. Nevertheless, *Flight of the Chiefs* is a noteworthy attempt to bring to the English reading public some samples of Fijian literature. The author deserves considerable credit for his painstaking care in assembling this anthology. It is a task which would daunt most anthropologists and one which few could have handled as effectively as Buell Quain has done.

CLELLAN S. FORD

NEW YORK CITY

Nusantara: A History of the East Indian Archipelago. BERNARD H. M. VLEKKE. (xv, 439 pp., 13 pls., 9 maps. $5.00. Cambridge: Harvard University Press, 1943.)

Nusantara is one of those books of excellence that measures up to all reasonable critical tests of scholarship and literature. To read and study it is a satisfying experience.

Professor Vlekke is one of the Netherlands' foremost historical scholars, and it is our good fortune that war circumstances have brought him temporarily to our midst and induced him to write a history of the Indies in the English language. Although it is the Dutch tradition for scholastic writing to be rigorously artless, Professor Vlekke possesses a skill that is brilliantly free of that characteristic. Nor has readability been attained at the expense of scholarly balance and reserve. The author's poise in the

handling of controversial historical issues, his fair sense of discrimination, his quality of judicious criticism, all combine to bar even the faintest note of polemic from his work.

The very title, *Nusantara*, reveals the author's sympathy with the aspirations of the Indonesians. *Nusantara* is a Malay name for the island area of the Indies, introduced by one of the first founders of a significant movement of Indonesian national aspiration.

Professor Vlekke intends this book to be an introduction into the study of the development of Indonesian civilization and of the effect of three hundred years of Dutch influence on the Malay world. He does not give us such an analysis of Indonesian culture as an ethnologist would formulate, for his approach is that of the social historian; nevertheless, he is primarily concerned with peoples and cultural influences. He treats history as "a record of man and his accomplishments based on written documents." The book is studded with acculturation data and information on Indonesian society. His materials are particularly enlightening on the place of princes and sultans in native social life and the role of religious-magical concepts in the native Indonesian states.

The successive penetration of Hindu, Mohammedan and Dutch cultural influences and their resultant consequences for Indonesia are carefully put. The narrow commercial interests and the calculated exploitation of the people for profit gain during the first two centuries of the East India Company domination enjoy no white wash, no apology. The ultimate emergence of the modern Dutch colonial administration and the processes which led to "the end of a colony and the birth of a nation" are followed through to the present loss of the islands to the Japanese. Here are much data for the student of administrative anthropology.

Extensive bibliographic references are footnoted throughout the work. Most of the sources are necessarily in Dutch, but where useful works are available in English, French, German, or Italian they are cited. There is also an effective chronological table, which correlates events in the archipelago with happenings in Holland and elsewhere, such as influenced Indonesian trends.

There can be no doubt but that many types of readers will be stimulated by this work; but anthropologists, especially those interested in the Far Pacific area, administrative anthropology, and acculturation, should take special pains not to overlook it.

E. ADAMSON HOEBEL

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PRE-HISTORY

Mankind so Far. WILLIAM HOWELLS. (319 pp. Illus. $4.50. New York: Doubleday, Doran & Company, 1944.)

Mankind so Far is a readable account of the later phases of human evolution. The book is designed for the beginning student or person without technical training. It fills the gap between the chapter or two devoted to evolution in introductions to anthropology and the much longer books, which are beyond the comprehension of the beginner.

The book is divided into three parts of approximately 100 pages each. In part one, the first few pages quickly introduce evolution, early vertebrates, and the mammals. Then there is a more leisurely account of the primates. The second part describes fossil man and the origin of Homo sapiens. The third is devoted to races and the racial history of the world. There are 44 well-chosen illustrations.

Factually, this book is up-to-date and includes accounts of the South African man-apes, the new finds of Pithecanthropus, Africanthropus, the Palestine Neanderthals, the Solo men, and Weidenrich's reconstruction of Sinanthropus. Into the descriptions Howells has skillfully woven the names and opinions of many of the scientists from whose writings he has drawn. Particularly in the sections on the primates and fossil man, he has been careful to indicate the widely differing interpretations of the same basic data. The whole section on fossil man is a model of popular, but still scientific, writing. Anyone who has struggled with the scattered, original reports will appreciate the immense task of reducing this vast subject to 100 readable pages.

The third part of *Mankind so Far* is more difficult to evaluate. There are good descriptions of the races of the world. These will be useful to the elementary student and of interest to anyone in these days of global war. There is some dubious racial history. Few will agree with the author's theories of Pygmy and Negro origins. One of the virtues of Howells' treatment of the earlier phases of human evolution is that, after describing the facts, he indicates the different interpretations which are possible. However, in the discussion of race there is no mention of numerous writers who would disagree with the author's point of view. Genetics is not considered, in spite of all that has been written on race and genetics in the last few years. Blood groups are dismissed as irrelevant to racial classification. The discussion of the nature of race is too short and not clear. Questionable subtypes and great groups of men are treated equally as races.

In sum, the first two parts of *Mankind So Far* are excellent and cannot be too highly recommended for use in introductory anthropology courses. The racial section might be quite misleading, unless supplemented by other material.

S. L. WASHBURN

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The Problem of Antiquity of Man in Australia. D. J. MAHONY; *The Keilor Fossil Skull: Anatomical Description.* J. WUNDERLY; *The Keilor Fossil Skull: Palate and Upper Dental Arch.* WILLIAM ADAM; *The Keilor Skull: Geological Evidence of Antiquity.* D. J. MAHONY (Memoirs of the National Museum, No. 13, pp. 7–81. Melbourne, 1943.)

Interest in the antiquity of man in Australia has always been associated with the question of the origin of the Australian aborigines. There are many theories to account for the origin of the latter, but in the absence of the necessary supporting evidence even the most attractive of them remains a speculation. The great hope has, therefore, been that the discovery of a series of fossil human remains in Australia would help to solve the problem of the origin of the Australian aborigines.

Upon two skulls found in Australia has been conferred the status of antiquity, and upon one of them the distinction of being the most primitive skull known to us. The first is the Talgai skull found in 1884 in Queensland, and the second the Cohuna skull found near Cohuna, Victoria, in 1925. The geological evidence relating to the antiquity of the Talgai skull is thoroughly unsatisfactory, yet the skull may well be of Pleistocene age. In the first of the papers listed above Mr. D. J. Mahony, Director of the National Museum at Melbourne, gives us an excellent account of the facts relating to the antiquity of man in Australia, including the circumstances under which the various finds were made. This paper will be indispensable to all students of the subject.

With respect to the Talgai skull it is quite clear that however ancient the skull may be it does not in any way significantly differ from that of the modern Australian aboriginal. Mr. Mahony is, apparently, unaware of the fact that Hellman's restoration of the palate brings this last straw to which some diehards have clung well within the range of the contemporary aboriginal palate.

The Cohuna skull has been described by Keith as "the most primitive human form known to us" (*New Discoveries Relating to the Antiquity of Man*, Norton, New York, 1931, p. 310). Found at a depth of two feet beneath the surface in red loam, it was at once established that the skull had no claim to geological antiquity. Then, adds Mr. Mahony, "The skull was acquired by Sir Colin Mackenzie, Director of the Australian Institute of Anatomy, who did not describe it but sent some data, with measurements and a tracing along the middle line of the skull, to Sir Arthur Keith. Keith (1931) published an account based on this information, and expressed the opinion that it is the most primitive known type of human skull. The error arose from the fact that Mackenzie mistook for bone the adhering mineral incrustation, which is up to a quarter of an inch thick in places; for this information I am indebted to Professor A. N. Burkitt. Professor J. L. Shellshear has kindly allowed me to say that, after Sir Colin Mackenzie's death, he removed the incrustation, and that from his observations on the skull he found that it falls within the range of modern aboriginal skulls, to which it is similar in all respects" (pp. 34–35).

The Cohuna skull has, unfortunately, already crept into the literature. It should be stricken from the record. I refrain from making any comment on the practice of describing crania on the basis of flimsy data supplied at second hand.

In short, there is nothing peculiar about either the Talgai or Cohuna skulls; the first may be ancient, the second is certainly not. Neither of them can be seriously considered in discussing the antiquity of man in Australia.

The case is different with the two skulls discovered, in October 1940, at a depth of 18 or 19 feet below the surface in a sandpit near Keilor, ten miles northwest of Melbourne. A quartzite artifact was found near the spot from which one of the skulls was recovered. Mr. Mahony believes that the terrace in which the skulls were found belongs to the Riss-Würm interglacial phase. A detailed study of the geology of the terrace is in preparation by Mr. R. A. Keble. The question of age may be left open until the publication of that report, though there seems little doubt of the antiquity of the skulls.

For reasons left unstated only one of the Keilor skulls has been deposited with the National Museum at Melbourne; this skull is described by Dr. J. Wunderly. From the measurements, contours, and photographs given by Dr. Wunderly it is quite clear that in all its characters the skull falls well within the range of the modern Australian skull. Dr. Wunderly thinks that the skull combines "Australoid and Tasmanoid characteristics in about equal proportions." The same remark could be made of innumerable Australian aboriginal crania. The fact is that it is more than doubtful whether the Tasmanians were a distinct ethnic group, separated by more than Bass Strait from the aborigines of the mainland of Australia.

If the geological evidence of antiquity is established then it will be possible to say that the Keilor skull is the most ancient Australian aboriginal known. The suggestion —and it is no more than that—is that the present-day aborigines have remained unchanged physically for a very long time. No light is thrown on what they may have

been like before they arrived in Australia. Quite possibly they looked just as they look today. I rather suspect that that will be found to be the case when all the evidence is in.[1]

The final part of this Memoir is devoted to a revision of a genus of ants, which reminds me that a typist I once employed made me write that "the proper study of mankind is entomology!"

M. F. ASHLEY MONTAGU

HAHNEMANN MEDICAL COLLEGE AND HOSPITAL

Los Origines Americanos. PABLO MARTINEZ DEL RIO. (Mexico, 1943).

This work is a painstaking synthesis of inquiries into the question of early man in the Americas, emphasizing the methods and approach of the Americanist school. It is, so far as I know, the first general work from Latin American sources that demonstrates Americanist aims, approaches, and methods. The organization of the book shows the completeness of its treatment: The first chapter is a statement of the problems; the second, a summary of "Geological and Paleogeographic antecedents"; then follow "The Somatic Evidence," "The Cultural Evidence," and finally the "Conclusions." In each field the important data bearing on the entry of man into the Americas is resumed, and the varying interpretations of them presented, along with some very conservative appraisals.

The conclusions are likewise conservative enough to weather the most critical of Americanist judgments: The American Indian belongs to the Asiatic variety of man, although several types are represented in this grouping, probably correlated with diverse Asiatic stocks, some of which differed considerably from the modern "Mongoloid." The earliest immigrants were the dolichocephalic "Paleoamerinds," among which two subtypes may be distinguished—the purest descendants of this group are to be found today only in the less hospitable refuge areas. The earliest immigration took place by way of Bering Strait, in all probability, with the use of the Aleutians as a migration route still uncertain, with penetration into the North American continent probably between 15,000 and 20,000 years ago; although there is a possibility that an entry was made prior to the culmination of the last glaciation, or about 40,000 years ago. The population of the Americas resulted from numerous and long-continued immigrations of small groups, bearers of the "basic complex"; the remainder of the native American cultural advances were made autochthonously. Australian and Melansian immigrations are out of the question, although it is tempting to think of the possibility of a late Polynesian contact; one, however, of minor significance in the scheme of American Indian population an l culture.

It might be possible to question a minor point here and there in the volume; for example: the acceptance of Sandia cave culture as the most ancient yet found, although the full results of those excavations are not yet available; the overlooking, in pointing out the sore spot of the lack of attempts to bridge the gap between the early cultures of the Folsom level and the well known ones of the last two millennia, of one shining excep-

[1] Since this review was written, Dr. Franz Weidenreich has informed me (*in litteris*) that the Keilor skull is almost identical with the Wadjak skulls found by Dubois in Java. The significance of this fact is of the first importance, for it lends strong support to the belief that the ancestors of the Australian aborigines emanated from the Javanese region.

tion: the Signal Butte study; and as well, of Howard's suggestion that Gypsum cave may partly bridge this lacuna (although this view is cited in another connection). But these are matters of slight import. What does count is that Martinez del Rio has been able to integrate a vast body of material into a coherent picture showing early man in America as seen through Americanist eyes, along with the basic concepts and methods by which that picture was developed.

PHILIP DRUCKER

MISCELLANEOUS

Contributions to the Genetics, Taxonomy, and Ecology of Drosophila pesudoobscura and its Relatives. TH. DOBZHANSKY and CARL EPLING. (Pp. 111–183. $2.25 paper, $2.75 cloth. Washington, D. C.: Carnegie Institution, 1944).

The three interrelated studies which comprise this volume represent a practical exemplification of the methods for the study of species and races of organisms. Both the concept of "race" and the methods of scientific description and study of races receive particular attention. The material utilized are the closely related species of flies Drosophila pseudoobscura and Drosophila persimilis. Since it is now perfectly clear that the laws of heredity and of genetic change are fundamentally the same for all living organisms, it seems likely that students of primate and hominid evolution may learn a great deal from such studies on flies concerning the means and the mechanism by which the living and extinct races and ethnic groups of man have come into being.

The first paper in this volume deals with the taxonomy, distribution, and ecology of Drosophila pseudoobscura and its relatives. The problems here dealt with are, in low relief as it were, essentially similar to the problems with which the anthropologist is confronted. The anthropologist will find this first paper enlightening, even fascinating, principally for the clarity of its exposition of the methods of the field geneticist. It is, however, in the second paper on *Chromosomal Races in Drosophila pseudoobscura and Drosophila persimilis* that Dobzhansky, who is one of the world's most distinguished geneticists and one of the few geneticists who is deeply interested in the problems of racial variability in man, deals with the process of raciation in the two species of Drosophila.

Dobzhansky points out that in spite of all the efforts of systematists and anthropologists the concept of race remains ambiguous. "This ambiguity," writes the author, "is inherent in the method, based on description of morphological averages, by which the problem has been approached. A racial type or standard is arrived at, which is, in effect, a system of statistical averages. Once such a type is established it becomes a tool for comparing races with one another and for deciding whether any given individual does or does not belong to the race in question" (p. 49).

Dobzhansky goes on to say that "An implied justification of this procedure lies in the principle, the validity of which is securely established, that species evolve from races; hence species and races are assumed to be consubtantial. Another, and apparently no less valid, justification can be claimed, in that the procedure has, on the whole, stood the test of experience: systematists and anthropologists not only have succeeded in reducing the chaos of diverse racial variants to an intelligible system, but also have produced a coherent picture of the distribution and migration of many strains

over the earth's surface. Nevertheless, although the method serves well as a device for the delimitation of species, it proves to be totally inadequate for the analysis of intraspecific variability" (p. 49).

Alas, we can only regret that the author's starry-eyed estimate of our performances far outruns anything the physical anthropologist has yet achieved. The achievement with which Dobzhansky generously credits us is still but a hope. The wagon of the geneticist is hitched to that most accommodating of creatures, Drosophila; the wagon of the anthropologist is hitched to a far less tractable creature, man. Some wagons get hitched to stars, Drosophila proceeds to pull its wagon with the speed of a comet; the wagon of the anthropologist is, by comparison, stuck in the mud. East and Jones, a quarter of a century ago, put the troubles of the physical anthropologist very neatly. "The difficulties," they wrote, "of the anthropologist are relatively much greater than those of other systematists. Intergroup sterility is a great aid to botanists and zoologists. In general their taxonomists have had only to differentiate strains which do not interbreed. The mission of the ethnologist may be compared rather to that of the agriculturalist who is called upon to produce a usable classification of the numerous strains of a variable domesticated species, such as cattle and swine, or even wheat and maize. He must for the sake of convenience make a morphological grouping that is non-existent in physical fact. He does this by taking advantage of isolation; without isolation it is impossible" (*Inbreeding and Outbreeding*, Lippincott, Philadelphia, 1919, p. 249).

After referring to the vast number of hereditary variations which have occurred in man, the complexity of their transmission, the interbreeding which has undoubtedly occurred among the main types, the shifting back and forth of traits which may originally have been characteristic of certain peoples, their combination and recombination, East and Jones point out that such facts show the fallacy involved in making a morphological system of classification a basis for tracing ethnic relationships. As they said in 1919, "It is wholly possible for example, that a tall, blue-eyed dolichocephalic Frenchman really possesses less of the so-called Nordic factors than a short dark-eyed round-head" (p. 250).

But there is more than a hope that we may some day unravel the tangled, dissociated thread, of man's prehistoric and living relationships. That hope, for the most part, lies in the genetic method of study and analysis. As Dobzhansky writes, "To analyze and describe races adequately it is necessary to analyze and describe the distribution of the variable genes one by one. A system of morphological averages may well serve as an exploratory device, but a basic understanding of principles of racial variation can come only from knowledge of the distribution and relative frequencies of variable genes and chromosome structures in a population."

The technique is a novel one and its methodological exemplification requires favorable material. There is no more favorable material at present known than Drosophila pseudoobscura and D. Persimilis. The phylogeny of the gene arrangements on the third chromosome (of the salivary gland cells) is almost perfectly known in these two beasts, so that from the commencement one of the final goals of racial studies is already available. The perfectly discrete phenotypical variants are genotypically recognizable as inversions, principally, of chromosome sections, and Dobzhansky's paper constitutes a thoroughgoing analysis of the ecological distribution of these variants.

The author makes it quite clear that these techniques were devised for the study of chromosome structure in Drosophila. He does not contend that these techniques can be directly applied to the racial study of other organisms. He says rather "that the general principle of the description of populations in terms of the relative frequencies of their genetic variants will prove to be widely applicable."

The anthropologist who would wish to satisfy himself as to the applicability of the genetic method to the problem of raciation in man will do himself a disservice if he neglects to read this fundamental study. Dobzhansky's study is full of rich insights for the anthropologist. Quotation, were space to permit, would be to transmute the gold of this study into some baser ore. I have marked so many passages for quotation and discussion that there is a real difficulty in selecting one in preference to another. These passages, and they are numerous, are of the utmost relevance to the anthropologist, and I can only urge him to go to Dobzhansky's paper itself. Here I shall whet the reader's appetite with a few of the interesting conclusions which emerge from this study.

Drosophila pseudoobscura and D. persimilis are almost identical in external appearance, yet in the course of this study it is shown that they are "specifically" different. Biological species are defined as "the stage in the process of evolutionary divergence at which an array of populations once actually interbreeding or capable of interbreeding has become split into two or more reproductively isolated arrays." Races are defined as "populations characterized by differing frequencies of the variable genes and chromosomal structures." Dobzhansky shows that a multitude of different orders of "racial" subdivisions are possible, and are shown to exist in the species investigated. Which of these subdivisions should be described and named as "races" in practice is a matter of conventions prevailing at a given time in a given branch of science. In any case, the racial variability is commensurable with the individual one, and the genotype of an individual is only to some extent, variable in different biological situations, determined by the genotype of the "race" from which it sprang. The race concept, as Dobzhansky here points out, and as Morant has said, is a tool for the description not of individuals, but of subdivisions of species. What is needed now are a few type studies on man, following the general principles set out in this study, which will serve as the pattern for much future work in physical anthropology.

In the paper concluding this volume Dr. Carl Epling considers the historical background of the fifteen known gene arrangements of D. pseudoobscura and D. persimilis in relation to their geographic distribution. Migration, independent origin, climatic and historical factors are all considered in what is really a most remarkable piece of analytic reconstruction.

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SOME NEW PUBLICATIONS

North America

Berreman, Joel. *Chetco Archaeology* (General Series in Anthropology 11. 40 pp. 10 pls., 7 figs. Menasha, 1944).

Ewers, John C. *Food Rationing is Nothing New to the Blackfoot* (Masterkey 18, No. 3. pp. 73–80). Los Angeles: Southwest Museum, 1944).

Freeman, Ethel C. *The Seminole Woman of the Big Cypress and her Influence in Modern Life* (American Indigena 4, No. 2. pp. 123–128. Mexico, D. F., 1944).

Heizer, Robert F. *Artifact Transport by Migratory Animals and Other Means* (American Antiquity 9, No. 4. pp. 395–400, 1 fig. Menasha, 1944).

Hewitt, J. N. B. *The Requickening Address of the Iroquois Condolence Council* (Journal of the Washington Academy of Sciences 34, No. 3. pp. 65–85. 1944).

Hibben, Frank C. and Herbert W. Dick. *A Basketmaker III Site in Canyon Largo, New Mexico* (American Antiquity 9, No. 4. pp. 381–385, 1 fig., 2 pls. Menasha, 1944).

Humphrey, Norman D. *The Detroit Mexican Immigrant and Naturalization* (Social Forces 22, No. 3. pp. 332–335. 1944).

Humphrey, Norman D. *Some Marriage Problems of Detroit Mexicans* (Applied Anthropology 3, No. 1. pp. 13–15. Boston, 1944).

Hurst, C. T. *1943 Excavation in Cave II Tabeguache Canyon, Montrose County, Colorado* (Southwestern Lore 10, No. 1. pp. 2–14, 3 pls. Gunnison, 1944).

Jennings, Jesse D. *The Archaeological Survey of the Natchez Trace* (American Antiquity 9, No. 4. pp. 408–414, 1 fig. Menasha, 1944).

Jones, Volney H. *Was Tobacco Smoked in the Pueblo Region in Pre-Spanish Times?* (American Antiquity 9, No. 4. pp. 451–456. Menasha, 1944).

Leighton, A. H. and Dorothea C. *The Navaho Door* (xviii, 149 pp. illus. $4.00. Cambridge: Harvard University Press, 1944).

Linton, Ralph. *North American Cooking Pots* (American Antiquity 9, No. 4. pp. 369–380. Menasha, 1944).

Malouf, Carling. *Thoughts on Utah Archaeology* (American Antiquity 9, No. 3. pp. 319–328. Menasha, 1944).

Mekeel, Scudder. *Comparative Notes on the "Social Role of the Settlement House" as Contrasted with that of the U. S. Indian Service* (Applied Anthropology 3, No. 1. pp. 5–8. Boston, 1944).

Moffett, Ross. *Materials Used for Chipped Implements* (Bulletin of Massachusetts Archaeology, 5, No. 3. pp. 42–47. Boston, 1944).

Morris, Earl H. *Adobe Bricks in a Pre-Spanish Wall near Aztec, N. M.* (American Antiquity 9, No. 4. pp. 434–438, 2 pls. Menasha, 1944).

Ritchie, Wm A. *The Pre-Iroquoian Occupation of New York State* (Rochester Museum Memoir 1. xvii, 416 pp., 165 pls., 6 figs. Rochester, 1944).

Susman, Amelia. *The Accentual System of Winnebago* (149 pp. New York, 1943).

Titiev, Mischa. *Old Oraibi: A Study of the Hopi Indians of the Third Mesa* (Papers of the Peabody Museum of American Archaeology and Ethnology 22, No. 1. 273 pp., 13 figs., 4 pls. 4 charts, 10 tabs. Cambridge, 1944).

Titiev, Mischa. *Two Hopi Tales from Oraibi* (Papers, Michigan Academy of Science, Arts, and Letters 29. pp. 425–437. 1944).

Voegelin, Erminie Wheeler. *Mortuary Customs of the Shawnee and Other Eastern Tribes* (Prehistory Research Series 2, No. 4. 444 pp. Indianapolis: Indiana Historical Society, 1944).

Webb, Clarence H. *Stone Vessels from a Northern Louisiana Site* (American Antiquity 9, No. 4. pp. 386–394, 2 figs. Menasha, 1944).

Wheeler, S. M. *Archaeology of Etna Caves, Lincoln County, Nevada* (92 pp., 40 figs. Carson City: Nevada State Park Commission, 1944).

Wheeler, S. M. and Georgia N. *Cave Burials near Fallon, Churchill County, Nevada* (7 pp., 2 pls. Carson City, Nevada State Park Commission, 1944).

White, Leslie. *"Rohona" in Pueblo Culture* (Papers of the Michigan Academy of Science, Arts, and Letters 29. pp. 439–443. 1944).

Middle America

Berlin, Heinrich. *A Tentative Identification of the Head Variant for Eleven* (Notes on Middle American Archaeology and Ethnology 33. pp. 16–19, 1 pl. 1944).

Drucker, Philip. *Ceramic Stratigraphy at Cerro las Mesas, Veracruz, Mexico* (Bulletin, Bureau of American Ethnology 141. 95 pp., 58 pls., 209 figs. Washington, 1944.)

Roys, Ralph L. *The Indian Background of Colonial Yucatan* (Carnegie Institution of Washington, Publication 548. 244 pp., 6 maps., 23 figs. $1.75, paper; $2.75, cloth. 1944).

Sterling, Matthew W. *Stone Monuments of Southern Mexico* (Bulletin Bureau of American Ethnology 138. 84 pp., 62 pls. Washington, 1944).

South America

Auza Arce, Carlos. *Cosco* (Revista del Museo Nacional 12, No. 2. pp. 212–224. Lima, 1943).

Baldus, Herbert. *Problemas Indigenistas no Brazil* (America Indigena 4, No. 1. pp. 9–18. Mexico, D. F., 1944).

Bennett, Wendell C. *Archaeological Regions of Colombia. A Ceramic Survey* (Yale University Publications in Anthropology 30. 120 pp., 12 pls., 20 figs. New Haven, 1944).

Bermejo, Vladimiro. *La Ley y el Indio en el Peru* (American Indigena 4, No. 2. pp. 106–111. Mexico D. F., 1944).

Clothier, Wm. J. *Recuay Pottery in the Lower Santo Valley* (Revista del Museo Nacional 12, No. 2. pp. 239–242. Lima, 1943).

de Mello, Leitão C. *Catalogo das aranhas do Rio Grande do Sul* (Arquivos do Museo Nacional 37. pp. 147–246. Rio de Janeiro, 1943).

Farfan, J. M. B. *El quenchua bibliográfico* (Revista del Museo Nacional 12, No. 2. pp. 228–234. Lima, 1943).

Ford, James A. *Excavations in the Vicinity of Cali, Colombia* (Yale University Publications in Anthropology 31. 79 pp., 4 pls., 19 figs. New Haven, 1944).

Henry, Jules, and Zunia. *Doll Play of Pilagá Indian Children* (Research Monographs 4. 133 pp. $3.00. New York: American Orthopsychiatric Association, 1944).

Herrara, F. L. *Nomenclature fitonomica* (Revista del Museo Nacional 12, No. 2. pp. 167–180. Lima, 1943).

Kroeber, A. L. *Peruvian Archaeology in 1942* (Viking Fund Publications in Anthropology 4. 151 pp., 48 pls., 8 maps. New York, 1944).

Kuczynski-Godard. *La Vida en la Amazonia Peruana: Observaciones de un Médico* (181 pp., 80 pls. Lima: Libreria Internacional del Perú, 1944).

Lastres, Juan B. *Medicina aborigin peruana* (Revista del Museo Nacional 12, No. 1. pp. 61–80. Lima, 1943).

Loomis, Charles P. *Extension Work at Tingo Maria, Peru* (Applied Anthropology 3, No. 1. pp. 19–34, 5 figs. Boston, 1944).

Métraux, A. *La causa y el tratamiento mágico de la enfermedades entre los Indios de la región tropical Sud-Americana* (America Indigena 4, No. 2. pp. 157–164. Mexico, D. F. 1944).

Ramos, Arthur. *Introducao a antropologia Brasileira. Vol. 1. As culturas Não-Européias* (540 pp. illus. Rio de Janeiro, 1943).

Uhle, Max. *Alter und Herkunft der Ruinen von Trahuanaco* (Revista del Museo Nacional 12, No. 1. pp. 14–18. Lima, 1943).

Valcarcal, Luis E. *La agricultura entre los antiguos peruanos* (Revista del Museo Nacional 12, No. 1. pp. 1–7. Lima, 1943).

Vizcarra, Enrique Castro. *Valle del Cuzco* (Revista del Museo Nacional 12, No. 2. pp. 225–227. Lima, 1943).

Oceania

Du Bois, Cora. *The People of Alor* (654 pp. illus. $7.50. Minneapolis: University of Minnesota Press, 1944).

Emory, Kenneth. *Polynesian Stone Remains* (Studies in the Anthropology of Oceania and Asia. pp. 9; 21, 5 pls. Cambridge; Peabody Museum, 1944).

Handy, Edward S. Craighill. *Two Unique Petroglyphs in the Marquesas Which Point to Easter Island and Malaysia* (Studies in the Anthropology of Oceania and Asia. pp. 22–31, 2 maps, 1 fig., 1 pl. Cambridge: Peabody Museum, 1944).

Hoijer, Harry. *Peoples and Cultures of the Southwest Pacific* (The South Pacific and the War. pp. 31–70. University of California Press, 1944).

Howells, W. W. *The Racial Elements of Melanesia* (Studies in the Anthropology of Oceania and Asia. pp. 38–49, 1 map. Cambridge: Peabody, Museum, 1944).

Linton, Ralph. *Culture Sequences in Madagascar* (*Ibid.* pp. 72–80).

MacGregor, Gordon. *The Gods of Rennell Island* (*Ibid.* pp. 32–37, 2 pls.).

Oliver, Douglas. *The Horomorun Concepts of Southern Bougainville* (*Ibid.* pp. 50–65).

Shapiro, Harry L. *Physical Differentiation in Polynesia* (*Ibid.* pp. 3–8).

Sharp, Lauriston. *Notes on Northeast Australian Totemism* (*Ibid.* pp. 66–71, 1 map).

The Southwest Pacific and the War (ix, 168 pp. $1.00. University of California Press, 1944).

Asia

Bowles, Gordon T. *Linguistic and Racial Aspects of the Munda Problem* (Studies in the Anthropology of Oceania and Asia. pp. 81–101, 2 pls., map. Cambridge: Peabody Museum, 1944).

Chi, Li. *The Prone Burials of Anyang* (*Ibid.* pp. 134–148. 2 figs., 1 pl.).

Coon, Carleton S. *Southern Arabia. A Problem for the Future* (*Ibid.* pp. 187–220).

Gual, James. *Observations on the Bronze Age in the Yeneset Valley, Siberia* (*Ibid.* pp. 149–186, 5 figs., 6 pls.).

Janse, Olov. R. T. *The Peoples of French Indochina* (War Background Studies 19. 28 pp., 25 pls. Washington: Smithsonian Institution, 1944).

Kramer, S. N. *Sumerian Mythology* (American Philosophical Society Memoirs XXI. xiv, 125 pp., 21 pls. 2 figs., map. $2.00. Philadelphia, 1944).

Physical Anthropology

Andrews, James M. IV. *Evolutionary Trends in Body Build* (Studies in the Anthropology of Oceania and Asia. pp. 102–121. Cambridge: Peabody Museum, 1944).

Chillida, Luis Alberto. *Caracteristicas métricas y morfológicas del húmero en los aborigenes argentinos* (Revista del Instituto de Antropologia 3, No. 1. pp. 1–33, 11 figs. Buenos Aires, 1943).

D'Avila, Bastos. *Alguns dados de cefalometria no escolar* (Arquivos de Museo Nacional 37. pp. 289–330. Rio de Janeiro, 1943.)

Hulse, Frederick S. *Physical Types Among the Japanese* (Studies in the Anthropology of Oceania and Asia. pp. 122–133, map. Cambridge: Peabody Museum, 1944).

Quevedo, Sergio A. *La trepanacion incana en la region del Cusco* (Revista del Museo Nacional 12, No. 1–2. pp. 8–13, 181–211. Lima, 1943).

Renaud, E. B. *Nasal Index of the Prehistoric Pueblo Indians—Nasal Index of the Basketmakers* (University of Denver, Dept. of Anthropology 2 and 3. pp. 1–14. Denver, 1944).

Miscellaneous

Bullen, Ripley P. *The Geographer as an Aid in Archaeological Problems* (Bulletin Massachusetts Archaeological Society 5, No. 3. pp. 33–34. Boston, 1944).

Castetter, E. F. *The Domain of Ethnobiology* (American Naturalist 78. pp. 158–170. March, 1944).

Childe, Alberto. *Estudo critico sobre um ponto de arqueologia e de atronomia egipcias* (Arquivos do Museo Nacional 37. pp. 59–147. Rio de Janeiro, 1943).

Ekbau, W. Elmer. *Geography as an Aid to the Archaeologist* (Bulletin, Massachusetts Archaeological Society 5, No. 3. pp. 34–37. Boston, 1944).

Goodman, Mary Ellen. *The Physical Properties of Stone Tool Materials* (American Antiquity 9, No. 4. pp. 415–433, 1 pl. Menasha, 1944).

Honigmann, John J. *Morale in Primitive Society* (Character and Personality 12, No. 3. pp. 228–236. 1944).

Hughes, Phyllis. *Man's Palate and the New World* (El Palacio 51, No. 3. 1944).

Kimball, Solon T. *Section on Reports and Memoranda* (Applied Anthropology 3, No. 1. pp. 16–17. Boston, 1944).

Kluckhohn, Clyde. *On the Use of Culture, Contact Situations in Regional Training* (16 pp. mimeo. Council on Intercultural Relations, 1944).

Miranda, Fernando Marquez. *A propósito de método etnologico* (Revista del Museo Nacional 12, No. 1. pp. 19–23. Lima, 1943).

Provinse, John H. *Anthropology in Program Planning* (Applied Anthropology 3, No. 1. pp. 1–5. 1943).

Quintana, Epaminondas. *Il Ingente Problema de Maiz en su Aspecto Agricola y Nutritivo* (America Indigena 4, No. 2. pp. 129–132. Mexico, D. F.).

Read, Margaret. *Notes on the Work of the Colonial Department, University of London Institution of Education* (Applied Anthropology 3, No. 1. pp. 8–9. Boston, 1944).

Schlipp, Paul Arthur. ed. *The Philosophy of Bertrand Russell* (Library of Living Philosophers 5. 815 pp. $4.00. Evanston: Northwestern University, 1944).

Wach, Joachim. *Sociology of Religion* (xii, 412 pp. $5.00. Chicago: University of Chicago Press, 1944).

BRIEF COMMUNICATIONS

DISEASE CONCEPTS IN NORTH AMERICA

A valuable and interesting world survey of aboriginal theories of disease causation has been made by Clements.[1] The types and distributions of the theories which he presents embrace well the main methods of interpreting disease in simpler societies; yet the basic analysis of disease causation concepts which he employs needs a little further scrutiny when applied to North America. What is said here as pertaining to Clements' paper applies equally well to the few other and less comprehensive studies dealing with this subject.[2]

Clements presents five primary theories as to disease causation. These are, in substance, as follows:[3]

1. *Sorcery.* Theories which ascribe sickness to persons who utilize magical techniques or mystical control over supernatural forces, i.e.: the burning of images and the magical manipulation of locks of hair, nail parings or clothing of intended victims. The *imitative magic* and *contagious magic* of Frazer. Also the use of controlled spirits for malefic purposes by a sorcerer.

2. *Breach of taboo.* The theories which explain sickness as a punishment sent by the gods for breach of religious or social prohibitions having divine sanction (sic).

3. *Disease object intrusion.* The theories attributing disease to malefic foreign substances such as pebbles, splinters, or small animals, in the body of the sufferer.

4. *Spirit intrusion.* The belief that disease results from evil spirits, ghosts, or demons in the body. Demons which become "vocal," causing violent behavior and insanity, are to be distinguished from those which work covertly to cause bodily disorders, and the presence of which can be ascertained only by the diagnosis of a medicine man.

5. *Soul loss.* The concept that sickness is caused by the separation of the soul from the body, either through the agency of ghosts or sorcerers, or through mishap during its wanderings while its owner is asleep.

While the above classification is highly satisfactory for its author's purpose of showing the distribution of the more important disease theories as culture elements, the categories are neither mutually exclusive nor parallel in significance.

Two types of causation may be identified from the viewpoint of proximity in the logic of explanation. The aboriginal diagnostician may attribute the disease to a condition within the body of his patient, or to a force acting remotely in time or place from the occasion of the suffering. Extraneous objects, such as rock crystals or lizards, may be removed from the body and shown to the spectators as disease causes, or it may be pointed out that a spirit has entered the patient's body or that his soul has been captured or his vital organs displaced. Such immediate bodily conditions we shall refer

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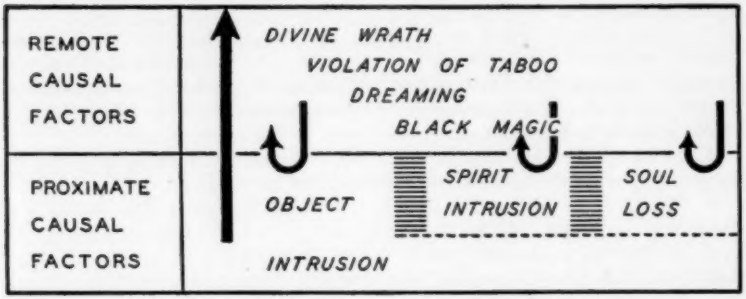
[1] Forrest E. Clements, *Primitive Concepts of Disease* (University of California Publications in American Archaeology and Ethnology, Vol. 32, No. 2, 1932), pp. 185–252.

[2] The classic account in this field is Max Bartels, *Die Medicin der Naturvölker* (Leipzig, 1893). Bartels gives the following as main causes of disease: (1) demons; (2) ghosts of the dead; (3) animals or ghosts of animals; (4) sucking or consuming by a demoniac; (5) a foreign substance, visible or invisible, in the body; (6) poison; (7) displacement or loss of principal parts of the body; (8) bewitching or cursing; (9) the will or the benevolent gift of the gods; (10) ill winds; (11) the evil eye (pp. 9–44).

[3] Clements, *op. cit.*, pp. 186–192.

to as *proximate* disease causes. On the other hand the illness may be ascribed to a *remote* force, as in the case of the Eskimo shaman who attributes the sickness of an old person to a taboo violated during youth,[4] or the alleged power of the Assiniboin conjuror to shoot evil spells at a distance of one hundred miles.[5]

It is important to note that in cases where the *proximate* disease causes have been diagnosed, a *remote* reason for their existence is often assigned. Thus *black magic* explains the presence of the disease-working crystals in the sufferer's body, or the absence of his soul. Magic as a technique is neutral and becomes "black" only when administered with malicious intent. Furthermore, the dissociation of the body and soul is of itself no cause for illness and may even be an advantage.[6] A soul mystically stolen and



SCHEMATIC REPRESENTATION OF PROPOSED RELATIONSHIPS BETWEEN THEORIES OF DISEASE CAUSATION

Remote causal factors which form the upper and more recent stratum are frequently used to explain the presence of proximate causes which belong to the lower and older stratum.

controlled by an enemy is a cause for mortal illness, however. In both of these cases magic is the instrument by which a person with malicious design works from some distance to bring about the bodily conditions which in turn are the proximate disease causing factors. Black magic, however, may be cited as the disease cause without specifying a proximate cause, as in the vague "casting of spells."

Violation of taboo works as a disease-causing factor by releasing uncontrolled *mana* or mysterious power through improper attention to prohibitions or obligations. Strictly considered, this is thought of as an automatic process, involving an impersonal and largely mechanical universe. A related remote cause of disease is *divine wrath*, where certain commissions and omissions result in the anger of gods, who in turn punish mortals with sickness and other forms of calamity as a visitation. The Eskimo belief

[4] Knud Rasmussen, *Intellectual Culture of the Iglulik Eskimos* (Report of the Fifth Thule Expedition, 1921–1924, Vol. VII, No. 1, Copenhagen, 1929), pp. 133–141.

[5] Edwin Thompson Denig, *Indian Tribes of the Upper Missouri* (46th Annual Report, Bureau of American Ethnology, 1930), p. 493.

[6] Rasmussen describes a case in which a hunter is considered invulnerable because his soul at birth was removed by a shaman and placed by an old lamp. Knud Rasmussen, *The Netsilik Eskimos, Social Life and Spiritual Culture* (Report of the Fifth Thule Expedition, 1921–24, Vol. VIII, Nos. 1–2, Copenhagen, 1931), p. 215.

that the violation of hunting prohibitions causes the hands of the sea-goddess Sedna to become sore, for which she punishes the transgressors, would fall in this class.[7] Clements loosely classes all such violations as *breach of taboo*. The distinction between taboo involving *mana* or *wakanda* and prohibitions involving the will of gods seems important enough to recognize, particularly in view of the fact that the instrumentality of a god brings in a more capricious element than the punishment automatically resulting from violation of taboo in its strict sense.

Another cause of the remote type, not mentioned by Clements but of considerable importance in the Pacific and Southwestern areas of North America, is *dreaming*. Park has well illustrated the importance of this factor among the Paviotso,[8] and it occurs to the south among the Navaho,[9] Yuma,[10] Pima,[11] and probably many more tribes. This involves dreams which are not merely prophetic of approaching disease or death, but which are themselves the cause of the sickness. Some experience during the dream, such as eating poisoned pellets, or an animal entering the body, may be involved.

It would seem possible, usually, for the ethnologist and the informant to distinguish clearly between the proximate bodily maladjustments and the more devious remote causes. A double diagnosis may even be made by the native diagnostician in a carefully considered manner and require the services of two medicine men for healing; one for the proximate, the other for the remote disease cause.[12] The double diagnosis is fairly common, even in our own culture. The grim fundamentalist who holds the belief that a person is ill through a "visitation" resulting from blasphemy and divine wrath, while at the same time admitting pathological causes for the same sickness, is partaking of this dualism.[13] In some instances either the proximate or the remote cause will be indicated without one of the other type. Among aboriginal peoples, the lack of a remote cause probably means that the culture is less developed in the sphere of supernaturalism, in

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[7] Franz Boas, *Religious Beliefs of the Central Eskimo* (Popular Science Monthly, Vol. 57, 1900) p. 626.

[8] Willard Z. Park, *Shamanism in Western North America* (Northwestern University Studies in the Social Sciences, No. 2, 1938), pp. 38–39.

[9] William Morgan, *Navaho Treatment of Sickness: Diagnosticians* (AMERICAN ANTHROPOLOGIST, Vol. 33, No. 3, 1931), pp. 400–401.

[10] C. Daryll Forde, *Ethnography of the Yuma Indians* (University of California Publications in American Archaeology and Ethnology, Vol. 28, No. 4, 1931), pp. 187, 191.

[11] Frank Russel, *The Pima Indians* (26th Annual Report, Bureau of American Ethnology, 1908), p. 253.

[12] The Navaho think of the proximate disease cause as providing an opportunity for the remote forces to attack the patient:

"The Navaho believe that there may be two untoward influences at work in the case of certain ailments: the obvious cause, such as an accident causing broken bones, and an unknown influence which might attack the patient in his weakened condition and which is waiting for just such an opportunity because of some previously transgressed taboo. Therefore a medicine man may be employed to treat the obvious symptoms; then, after he has worked a while, a diagnostician may be called to discover the second influence and to recommend another medicine man who can deal with it." (Leland C. Wyman, *Navaho Diagnosticians*, AMERICAN ANTHROPOLOGIST, Vol. 38, No. 2, 1936), p. 238.

[13] The Old Testament explains disease as the visitation of an angry God. (*Numbers* 12: 1–12; *Leviticus* 26: 14–16). The New Testament suggests more generally that disease is a penalty for sin. In this matter *John* 5: 14 and *Luke* 5: 18–24 refute the seeming contrary import of *John* 9: 1–3.

view of the higher psychological complexity of the remote explanations. Failure to specify a proximate cause, where remote causes are indicated, may merely mean that the proximate theories have been obliterated by the more impressive character of the remote cause theories, or that the medicine man himself, while assuming the existence of a proximate cause, considers it relatively unimportant in comparison with the remote force. Thus the informant, in either case, will report only the remote cause .

It should be borne in mind that many variants of the basic disease concepts may be found, as well as occasional beliefs of quite different character.[14] No listing or classification of disease concepts can hope to be exhaustive because the segregation of types may narrow down even to the personal inventions of individual medicine men. The following revised classification, however, includes most of the New World concepts and is offered as having some advantageous features over the lists previously prepared:

I. Proximate Disease Causes
   - Object Intrusion
   - Spirit Intrusion
   - Soul Loss

II. Remote Disease Causes
   - Black Magic
   - Dreaming
   - Violation of Taboo
   - Divine Wrath

While this commentary is directed primarily at the classification problem, some brief attention may be given to the psychological and historical relationships between the several main disease concepts.

In general, the proximate types of disease theory are psychologically more elementary and are probably older historically than the remote "pathological" doctrines. Intrusion theories were, in the dawn of human therapeutic experience, somewhat justified through the benefits of empirical surgery in cases where weapon points or sharp thorns were embedded in the skin.[15] (Intrusion theories are, furthermore, the basis of modern scientific pathology in the sphere of infectious diseases.) The soul loss theory is a more imaginative concept, being based on the psychologically intricate doctrine of souls and their discarnation. It is not uncommonly found side by side with the intrusion theory, probably as a supplementary development. The remote theories may be best thought of as an overlay of more complex thinking, resorted to, in the course of spiritual evolution when the direct cause and effect logic of the proximate theories failed to satisfy the enquiring intellects of patients and doctors.

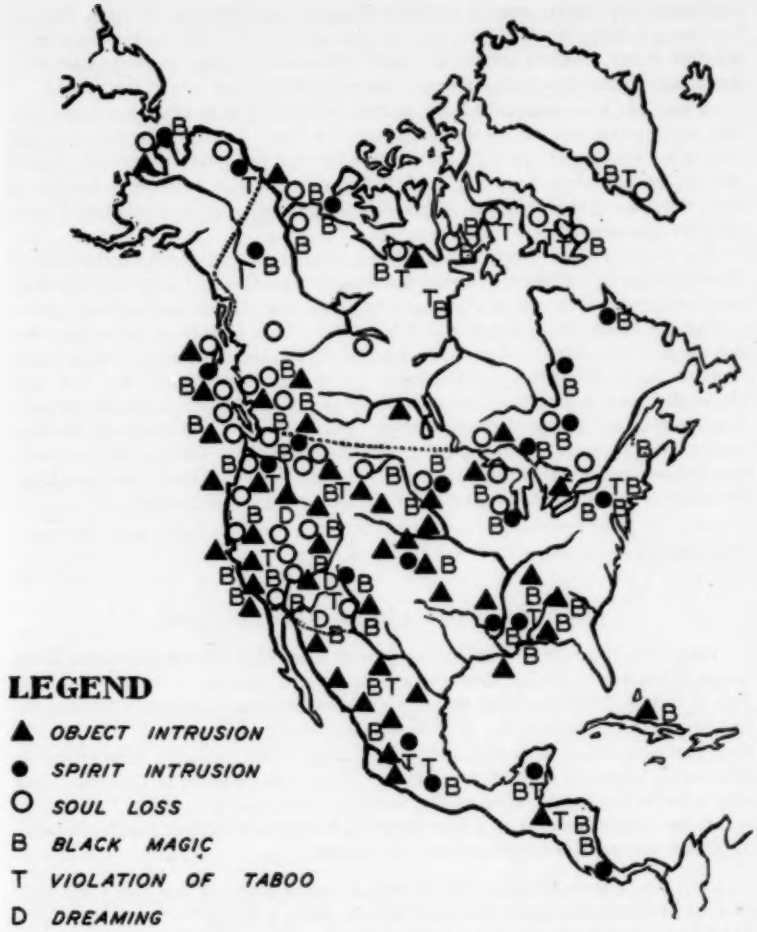
Lowie has pointed out the probable historical precedence in North America of the object intrusion theory over the soul loss concept, the former apparently having been the earlier of the two to be diffused from Asia.[16] Following a suggestion of Tylor,[17] he

[14] Two sources of disease cited fairly commonly in the New World are *animals* and *ghosts*. The ideology behind both of these is closely related to *violation of taboo*. Even where the taboo factor is no longer clear, *e.g.*, where a particular disease is said to be caused by a certain animal without further explanation, it seems probable that the violation of a taboo respecting the animal may be the basis for the belief.

[15] Edward B. Tylor, *Researches into the Early History of Mankind and the Development of Civilization* (New York, n.d.), p. 279.

[16] Robert H. Lowie, *Primitive Religion* (New York, 1924), pp. 176–180.

[17] Edward B. Tylor, *op. cit.*, pp. 276–279.



MAP SHOWING DISEASE CONCEPTS IN NORTH AMERICA
(Revised from Clements)

advances the theory of great antiquity, perhaps palaeolithic, for the object intrusion theory in the Old World. The spirit intrusion theory is probably more recent, and is believed by Clements to have had its origin in Asia between the end of the Pleistocene and the beginning of the Neolithic.[18] There seems little reason for believing that the

[18] Forrest E. Clements, *op. cit.*, p. 240.

soul loss concept differs much in antiquity from the spirit intrusion doctrine. The soul loss theory is better developed in Arctic America and western Canada than elsewhere in the New World, probably because of Asiatic influence, or perhaps to some measure the American cultures may have influenced those of northeastern Asia in this respect.

A map has been prepared for the purpose of bringing to a somewhat larger scale than on Clements' world maps the distributions for North America. The writer has previously revised Clements' maps to distinguish between proximate and remote causes[19] and this has been done here. The symbolism is changed from hatching to spotting in order to bring out the limitations of coverage more clearly, and some additional materials have been used.[20]

The analysis of the North American map offers few hints of "Kulturkreisen" or "Kulturschichten." Clements surveys his material from this viewpoint without satisfactory results. It is the writer's feeling that extreme caution must be exercised in interpreting historically the distributional data on this subject because of the complexities and the uncertain patterns of coverage. Rapid diffusion, the obliteration or obscuration of whole blocks of ideology and numerous "psychological mutations" may well have played their part in making things difficult for the culture historian. A brief reflection over the maniacal tangle of theories which exist in our own civilization on the same subject—the innumerable "therapys" and faith healing cults—leads to the conclusion that theories in the field of disease causation and cure spring up easily and spread rapidly without much regard to each other or the total culture configuration.

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CHIPPEWA BURIAL AND MOURNING CUSTOMS

The account below was sent to me by John E. Kingfisher, a Chippewa Indian of the village of Reserve on the Lac Courte Orielle Reservation in northeastern Wisconsin, on June 3, 1940. Kingfisher assisted me as an informant and interpreter while I was on the Lac Courte Orielle Reservation in 1935 collecting ethnological material. The material then gathered, along with that obtained on eight other Chippewa reservations in Minnesota, Wisconsin, and Michigan from 1932 to 1940, is found in *Chippewa Child Life*, a forthcoming publication of the Bureau of American Ethnology, Smithsonian Institution, Washington, D. C. I have corrected Kingfisher's English. I wish to express my sincere appreciation to him. His account follows:

A few weeks ago a Chippewa World War I veteran died near here. He had a wide circle of friends among both whites and Indians. Being a World War veteran myself I wanted to pay him my respects. I also wished to make some observations on the

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[19] Spencer L. Rogers, *Primitive Theories of Disease* (Ciba Symposia, Vol. 4, No. 1, 1942), p. 1201.

[20] Clements' coverage is particularly weak for northern Mexico. The data and references of the following are useful for this area: Ralph L. Beals, *The Comparative Ethnology of Northern Mexico before 1750* (University of California Ibero-Americana 2, 1932), p. 128; table 126, p. 213.

burial ceremonies. This Indian was a pagan, as the whites say.[1] Among those attending the burial, I knew, would be a number of Catholics, former pagans. From these I hoped to secure some information.

I had often wondered why our Indians buried their dead almost immediately after death. If someone died in the early hours of the morning and it was possible to make preparations for burial, he was buried that same day. I was told, on this occasion, that it was done because the spirit of the dead did not leave at death but immediately after the burial. And since it takes four days for the spirit of the dead to reach the happy land of the dead, people want to bury their dead immediately after death so as to help them to reach the place of happiness as soon as possible.[2] If the remains must be kept through a night, the people go to the home of the deceased, not only to keep company with the immediate and sorrowing relatives but also with the person who lies there.

This veteran had to be kept over night. At intervals of an hour or more all through the night, songs were sung, usually by one of several medicine men. These medicine men were the ones who officiated at the spring and the fall *Mide wiwin*, the ceremonial familiarly known as the medicine lodge. Each song had its own significance. They were sung only at wakes. The words of them are like those of the burial and wake hymns of other religious denominations. I noticed after the third or fourth interval, that whenever a song was started, the nearest relative—in this case a sister of the deceased—rose from where she was sitting and took into her hands the hide which the deceased had carried during the *Mide wiwin* ceremonials. It was lying on one end of the casket. The United States flag which had been draped over the casket had been folded over so as to make place for the hide. They were very careful that nothing rested on the flag. Even the bowl of tobacco and the pipe were placed to one side to make way for the great American flag.[3] Immediately after the woman took the hide, she began to dance gently and quietly around the casket, holding the hide in such a way that had it been alive it would have cast its eyes to the sky above. Next she pointed its face at each person in

[1] By pagan generally is understood a member of the native Chippewa religion, the *Mide wiwin*. Warren, a native, defined it as the Chippewa "mode of worshipping the Great Spirit, and securing life in this and a future world, and of conciliating the lesser spirits, who in their belief people earth, sky, and waters. . . . " (William Warren, *History of the Ojibways*, Minnesota Historical Society Collections, 5: 100). The *Mide wiwin* ceremonial is held each spring and fall, and can be held at any time of the year as a thanksgiving or petition offering. A person of any age may become a member. Members progress from one degree to another. Ceremonials and degrees differ somewhat on the various reservations. Groups in all reservations have four degrees; some have as many as eight. Members of the more advanced degrees are called medicine men and medicine women. It is believed that they are able to exercise unusual supernatural powers. (Unless otherwise stated the footnotes of this paper are based on my field work among the Chippewa from 1932 to 1940.)

[2] Spirits went westward "to where the sun sets". In the early day burials were in flexed, sitting position with knees pulled up toward chest. For four days and nights food is kept near the grave and a fire built at dusk. It is kept burning through the night. The belief is that the spirits of the food and the fire will be used by the deceased to sustain himself while travelling to the hereafter.

[3] Smoking kinnikinnick with a special pipe was a part of all ceremonials. The bowl contained the kinnikinnick. A similar bowl and pipe were seen by the writer near some sacred drums among the Menominee on the Keshena Reservation in Wisconsin in 1936.

the room, each person rising when being pointed at and joining in the dance.[4] Doing so, however, was entirely voluntary. But persons not participating in the dance were expected to rise, much in the same manner as all rise when the United States flag passes by or when our national anthem is sung or played. This was done two or three times during the night. Between songs and when all was quiet, the medicine men took turns consoling the sorrowing relatives with appropriate words.

I might explain here that the length of the religious instructions received by the early Chippewa was marked off by the degrees of the *Mide wiwin*. The degrees were much the same as the grades that our present-day students must pass in order to be promoted from a lower grade to a higher one. In his first initiation into the religious life of the tribe a Chippewa was given a hide of the lowest type of creature. At each subsequent meeting of the the *Mide wiwin* he was advanced a degree, provided the chiefs and headmen concluded that he had passed the tests which justified admitting him into the next degree. As each degree was granted him, he was given a hide of greater value. Those who follow the old Chippewa life today measure their religious life by these degrees. Very few reach the final degree. When any one does so, he either becomes a conductor of ceremonies and is called a chief medicine man or he becomes one of the advisors on the staff of instructors of the *Mide wiwin*. Most Indians make three or four degrees. When one has passed all the seven degrees, he is considered a master of the religion: he is now in a position to act as a spiritual guide to his fellow men.

One of the many requirements to be met by a Chippewa during his younger years is fasting at intervals over a period of time. A youth has reached the first period of his life after he has gone without food and water for a certain number of days. The ability of a boy to fast has much to do with his future.[5]

As I recall it, the day of burial was dark and gloomy, damp and threatening. I was delegated by the Stone Lake Post of the American Legion,[6] which conducted the military funeral, to blow taps at the conclusion of the military salute. The funeral was set for two o'clock in the afternoon. I was waiting in the cemetery grounds. It looked as though rain might begin to pour any minute. As the hour of two o'clock neared, I noticed a few cars park near the grounds. These cars were occupied by whites from around the lake region where the man who was being buried had lived. Soon I saw the colors of the Legion waving from one of the cars that were now approaching and I knew then that the procession of cars had arrived. The members of the Legion lined up near the road, and soon the hearse drew up. The pall bearers, mostly Indians who had served in the United States Army during the First World War, took the casket and proceeded toward the grave. The Legion assembled around the grave just in front of their firing squad. Then one of the men in the crowd stepped up to an old Chippewa, spoke quietly to him, telling him to make the final speech, but to make it brief since it looked as

[4] Two women dancers at the *Mide wiwin* celebration in 1938 near Ponsford, White Earth Reservation in Minnesota, pointed the faces of stuffed weasels at persons.

[5] Fasting during the years from about the age of reason to adolescence by both Chippewa boys and girls was institutional. Girls usually fasted four days; boys, sometimes as many as ten. A ten-day fast assured the boy of powers that entitled him to be a medicine man. Shorter fasts provided both boys and girls with a guardian spirit whose prerogatives were to give advice, knowledge, and supernatural powers.

[6] Stone Lake, Wisconsin, a settlement of Chippewa and whites just off the Lac Courte Orielle Reservation.

though it might pour rain any moment. The old man took off his cap, and these are the words he spoke in Chippewa: "My dear nephew: You are about to depart from us and this world. It will not be for long that we shall be parted, for we shall soon follow you. As we witness your departure from this world, the temporary home of us all, we are happy and proud to see the many friends and relatives who surround the place where your remains shall lie. Around you here stand the heroes of the World War to bid you God speed and farewell in the most fitting manner known to mankind. The great flag of the United States, which you helped to protect with your life, is draped over your remains. All this is a grand sight! I could almost say you have a happy departure. It should be so, in consideration of your services to your fellow men. We feel proud of your achievements in this world. May you, when you reach that happy land of our forefathers, continue to be to us what you were while living with us. Assist us, now that you will be with those that have the power to give to us knowledge and light, by showing us the way to that happy land. Dear nephew: (Just at this time a flash of lightning crossed the skies and a loud crash of thunder was heard.) We now bid you farewell. Now even the heavens register an emotion at your departure."

The firing squad fired the salute. I sounded taps. The casket was lowered during a terrific downpour of rain. The crowd disbanded in the midst of a great shower. It was touching to see so large an attendance of whites at this Indian burial. The whites came to pay their respects to the man whom they had admired. I followed the crowd that went to the home of the deceased. Here it was decided to complete the ceremonies that night. Generally on the evening following the burial a dance called Pow-wow is held at the home of the deceased. It is given to console the sorrowing relatives. During it speeches are made by the leaders of the tribe to distract the minds of the relatives so that they will not grieve too much over the departed one. This act is interpreted as an act of consolation.

At dusk after burial, or just before it turns dark, some one is designated to build a small fire at the head of the new grave. This is done because people wish to help the departed one, for the light of the fire is to guide him to the place he is going. The fire is lit four consecutive evenings. At the end of the fourth day—the spirit of the departed has reached the place of happiness, then—a feast is given. At this feast the hide which represents the last degree which the deceased attained in the *Mide wiwin* is disposed of. Usually, too, on this occasion all of his worldly belongings, such as clothes, guns, implements, etc., are given to persons selected by the chief medicine man, the one conducting the ceremonies. After all the articles have been given away, the ones to whom they were given are invited by the medicine man to assist in making the so-called bundle.

The bundle contains a dish and articles of clothing. The clothing is supplied by those that had been given clothing belonging to the deceased. The clothing must be new.—In the case of a woman who died recently, the persons to whom clothing had been given supplied new aprons, footwear, and some other articles. These were all wrapped into the bundle.—The dish is wrapped into a blanket, the clothing into another bundle, and then both bundles are wrapped into one bundle. The bundle was given to the wife of the deceased man; or in case the wife died, to the husband. In the case of the deceased veteran, his sister got both of the bundles, the one with the dish and the one with the clothing. She gave the articles of clothing to those she thought worthy of wearing them.

The bundle with the dish is to be carried for one year by the one to whom it is given. At each meal eaten by the one carrying it, either in his own home or as a guest elsewhere, food of each kind served at the meal is placed on the dish. The dish is filled with food, therefore, just as it would be if it were being used by the person for whom it was being carried.[7]

For one year following the death of a partner, the widow or widower is not permitted to marry. In the early day a widow in mourning busied herself making articles of clothing, such as moccasins, beaded shirts, and other forms of clothing worn by men, enough to enable a man to change clothing once. At the end of a year the dish and the clothing she had made were brought to a feast at which all the dignitaries of the *Mide wiwin* and of the tribe assembled. At the feast these men presented her to the brother of her husband to whom she then gave all the clothing she had made. In the absence of a brother the clothing was given to a member of the gens to which the deceased had belonged.[8] Marriage was also encouraged with a man who belonged to the deceased husband's gens. I might say here that it was against the custom of the people to marry someone of one's own gens; the relationship of members of a gens was that of brother and sister. They were not blood relatives, however.

At the end of the year of mourning the woman is free to do as she pleases about her future. Today many of our Indians still adhere to some of the old customs and traditions, but they no longer recognize the gens as a prohibition for marriage. A woman, therefore, may marry anyone whom she wishes, except such as the State law forbids her to marry.

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AN INDIAN TRADITION RELATING TO THE MASTODON

In the light of archeological discoveries made during the last two decades there can scarcely be any doubt concerning the contemporaneity of man with the horse, ground-sloth, camel, mastodon, and mammoth through, at least, the greater part of North and South America. The evidence indicates that the last of these mammals to become extinct was the mammoth. There is even a possibility that in certain parts of the country the mammoth may have lingered on up to as recently as five hundred years ago.[1] How-

[7] Today the bundle generally consists only of a dish wrapped in cloth (*wiwapidjigan*). The bundle is unwrapped wherever the carrier eats a meal. Food is placed on the dish and at the end of the meal it is eaten by someone present other than the carrier. Sometimes only an unwrapped dish is carried (*onakan*). Often a few hairs of the deceased were also carried in the bundle with the dish. At the feast given at the end of the year of mourning, the taboos regarding participating in seasonal occupations were lifted. Mourners again braided their hair and dressed with care. The name of the deceased was never again pronounced.

[8] Gentes (*dodam*) were exogamic. Members treated each other as brothers and sisters. Each gens was designated and perpetuated by some animal.

[1] In several conversations with the writer, Professor William Berryman Scott, the doyen of American paleontologists, has given it as his opinion that, had the first of the Spanish discoverers of America penetrated into the interior, it is quite possible that they might have met with the living mammoth. Another distinguished American paleontologist (whose special interest is the horse) is, I understand, of the opinion that the horse never became extinct in America. The argu-

ever this may be, a critical examination of Indian myths and traditions relating to giant mammals has led Strong to the considered view that these represent "historical traditions" based on fact "rather than mere 'myths of observation' or recent Caucasian introductions."[2] This conclusion has, I think, been generally accepted.

The traditions thus far examined relate principally to the mammoth. Recently I came across what is perhaps the earliest record of an Indian tradition concerning an extinct mammal, the suggestion being that it was the memory of the mastodon that was preserved in this tradition.

It was Robert Koch, the first systematic fossil hunter in this country and the first discoverer of human artifacts in association with the remains of extinct mammals, namely, the ground sloth *Mylodon harlani* and the mastodon *Mastodon americanus*, who published what is perhaps the earliest account of such a tradition. The first discovery referred to was made in October, 1838, near the Burboise River, in Gasconade County, Missouri, the second discovery being made in late March, 1840, near the shore of the river Pomme de Terre, in Benton County, Missouri.

Koch published an unsigned account of his first discovery in *The Presbyterian*, a weekly newspaper published at Philadelphia. He took the fossil bones to be those of a mammoth and under that name published his account of the skeletal remains,[3] but as I have elsewhere shown the remains he describes are clearly those of the ground sloth *Mylodon harlani*.

The mastodon was a great find, and in almost perfect condition. Koch at once hit upon the idea of exhibiting it to the public, and for this purpose he wrote a descriptive pamphlet of his find, calling the animal the "Missourium," and adding an account of "Indian Traditions." This was published in 1841.[4] The account of the "Indian Traditions" occurs on pages 10–12, and is as follows:

INDIAN TRADITIONS

It is perfectly true that we cannot, with any degree of certainty, depend on Indian traditions; but it is equally true, that generally these traditions are founded on events which have actually transpired, and according to their importance in relation to the welfare of the aborigines among whom they occurred, and in the absence of any better method of perpetuating them, are trans-

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ment is that the horse is a slow breeder, and that its enormous increase in so short a time in the post-Columbian period suggests that while the horse became an Indian domestic animal only after the Indian had learned its use from the Europeans, the stock drawn upon was primarily the native American horse.

[2] W. D. Strong, *North American Indian Traditions Suggesting a Knowledge of the Mammoth* (AMERICAN ANTHROPOLOGIST, vol. 36, 1934), pp. 81–88.

[3] For an account and discussion of Koch and his discoveries see M. F. Ashley Montagu and C. Bernard Petersen, *The Earliest Account of the Association of Human Artifacts with Fossil Mammals in North America* (Proceedings of the *American Philosophical Society*, vol. 87, 1944), pp. 407–419. See also M. F. Ashley Montagu, *The Earliest Account of the Association of Human Artifacts With Fossil Mammals in North America* (Science, vol. 95, 1942), pp. 380–381.

[4] Albert Koch, *Description of the Missourium, or Missouri Leviathan; Together with its supposed habits, Indian Traditions concerning the Location from whence it was exhumed; Also, Comparisons of the Whale, Crocodile and Missourium, with the Leviathan, As described in the 41st chapter of the Book of Job*. St. Louis, 1841. The date printed on the cover of the pamphlet is "1840," the date on the title-page is "1841."

mitted with great care in their legends from generation to generation; but in the course of time, as might reasonably be expected, these traditions lose much in correctness and minuteness of detail, owing to the circumstances, more or less, in which the tribes have been placed. As I am constrained to confine my remarks within very circumscribed limits, I will only relate one of the traditions having reference to the existence of the before described animal: this one, however, led principally to its discovery.

At the time when the first white settlers emigrated to the Osage country (as this section of territory is usually called), it was inhabited by the Osage Indians, and the river by which it is watered was called the Big Bone river, owing to a tradition preserved by them, which they stated as follows:

There was a time when the Indians paddled their canoes over the now extensive prairies of Missouri, and encamped or hunted on the bluffs. (These bluffs vary from 50 to 400 feet in perpendicular height.) That at a certain period many large and monstrous animals came from the eastward, along and up the Mississippi and Missouri rivers; upon which the animals which had previously occupied the country became very angry, and at last so enraged and infuriated, by reason of these intrusions, that the red man durst not venture out to hunt any more, and was consequently reduced to great distress. At this time a large number of these huge monsters assembled here, when a terrible battle ensued, in which many on both sides were killed, and the remainder resumed their march towards the setting sun. Near the bluffs which are at present known by the name of the Rocky Ridge, one of the greatest of these battles was fought. Immediately after the battle, the Indians gathered together many of the slaughtered animals, and offered them on the spot as a burnt-sacrifice to the Great Spirit; the remainder were buried by the Great Spirit himself in the before mentioned Pomme de Terre, which from this time took the name of the Big Bone river, as well as the Osage, of which the Pomme de Terre is a branch. From this time the Indians brought their yearly sacrifice to this place, and offered it up to the Great Spirit as a thank-offering for their timely deliverance; and more latterly, they have offered their sacrifices on the table rock previously mentioned, which was held in great veneration, and considered holy ground.

This ceremony was kept up with the utmost rigidity until one of the white emigrants settled in the valley at the foot of the rock, with the intention of making himself and family a permanent residence on this fertile spot; but he did not long enjoy this beautiful situation, for on the return of the Indians to offer their wonted sacrifice, they beheld with indignation and astonishment the intrusion of this venturesome settler on their sacred ground. Soon the council fire was kindled, when the Indians gave their accustomed murmur of dissatisfaction, and immediately the white man was obliged to leave, without the least preliminary ceremony. Some time after this, on becoming better acquainted with his red neighbors, and having through much perseverance gained their good opinion, after much reluctance on their part, and explanations and assurances that he would not infringe on their sacred privileges, and would only raise corn and potatoes for his family, he was once more permitted to settle on this sacred spot, of which he retained peaceable possession until the return of some old chiefs, who had been for a long time absent. They in turn were exasperated to madness on seeing the violation of the sacred ground of their forefathers by the encroachment of the white man, and again the poor farmer was obliged to leave. From that time this spot remained in the hands of the Indians, and no entreaty or allurement could be held out to induce them to resign it, until they were removed by the government; it then for the third time fell into the hands of the original settler, who joyfully took possession of the place he had so long desired to make his home.

After a while other settlers arrived, and as the want of a mill for grinding their different kinds of grain began to be felt—each family having hitherto been obliged, in order to obtain a supply of meal, to resort to the laborious process of pounding their corn in mortars—the old farmer resolved on building a tub-mill for the accommodation of himself and his neighbors. In order to procure

the necessary water power, the aid of the before mentioned spring was brought into requisition; and in making the necessary excavation, the laborers found several bones of young mastodons, which excited their curiosity and astonishment, but they suspended their labor on ascertaining that the force of said spring was not sufficient for their purpose. Soon after this the place was sold, and the excitement about the bones and the Indians was forgotten until the summer of 1839, at which time a young man, who was employed to clean said spring, found a tooth of a mastodon during his labor, which occurrence reminded several of the old settlers of the former transactions and traditions, and a narration of these induced a few persons residing in that vicinity, out of mere curiosity, to make further examination as to what was contained in the spring. They succeeded in finding several bones and teeth; but the mud and water accumulated so fast, they soon became discouraged with the difficulties attending the search, and gave it over. Some of these facts came to my knowledge in March, 1840, on my return to St. Louis from an excursion to the south-western part of the country, when I immediately repaired to the spot, and found the facts as I have here stated.

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MEKEEL TO COLLIER

Mr. John Collier, the Commissioner of Indian Affairs, has written an ingenious reply to my article, *An Appraisal of the Indian Reorganization Act*.[1] I am sorry that Mr. Collier saw fit to ignore both the major implications of the article and the spirit in which it was written. As he well knows, I have supported his major objectives both while I was associated with him and since.

I prefer to let the matter rest until there is a thorough review of the working out of the Indian Reorganization Act on the various reservations. Then it will be possible to determine whether or not my article is "crowded with factual inaccuracies" and "errors." However, at this time I should like to state that I took the usual precaution of having the manuscript checked by outside sources before it was submitted for publication. Meanwhile, if anyone has legitimate use for my comments on the points specifically raised by Mr. Collier, I shall be glad to give them by correspondence.

SCUDDER MEKEEL

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GILBERT ISLAND HORTICULTURE

The only food plant cultivated by the Gilbert Islanders is the bobai, a local variety of taro. A starch obtained from the tuberous root of this plant is a major staple with these people. In economic importance locally the bobai is second only to the coconut as a source of vegetable food.

The local importance of the bobai is due to its ability to grow and mature in the brackish waters of the coral atoll islets. In this respect it is unique among the

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[1] Scudder Mekeel, *An Appraisal of the Indian Reorganization Act*. AMERICAN ANTHROPOLOGIST Vol. 46, No. 2, 1944), pp. 209–217.

John Collier, *Collier Replies to Mekeel* (AMERICAN ANTHROPOLOGIST Vol. 46, No. 3, 1944), pp. 422–426.

taros. In the case of even this hardy plant, however, should the weather be unusually dry over a considerable period of time, thus increasing the salinity of the sub-surface water, the growth of the bobai is seriously retarded. Under ordinary circumstances the plant will produce a large root stock eighteen inches to two feet long in from twelve to twenty-four months.

This taro is a striking growth. Its huge, four-foot, arrowhead shaped leaves are borne on lengthy stalks giving the whole plant a height of from eight to ten feet.

Bobai gardens are numerous around the more populous villages. Their location is always toward the center axis of the islands, i.e., as far from the ocean as these narrow strips of land will permit. The reason for this has already been indicated—the bobai thrives best on the least brackish water available which is logically to be found as far from the shore as possible.

Most of the bobai gardens are very old, having been used for generations by the descendants of the men who excavated them. The construction of the typical bobai pit is no mean task for primitive engineering. An area from thirty to forty feet in breadth and usually considerably greater in length is excavated to a depth of from four to five feet, or to whatever level is necessary to achieve a permanent water depth of two or three inches. The value of the garden itself as property and also as a continual source of food makes the expenditure of the relatively huge amount of labor by a single family well worth while. With little in the way of upkeep a bobai garden, once excavated, may be employed practically indefinitely. Many of them, according to native report, are exceedingly old.

The walls of the bobai garden are vertical for a distance of between two and four feet from the level floor. If necessary they may be strengthened by flat slabs of roughly squared coral built up as retaining walls. Above the vertical sections the sides slope away to the general level of the surrounding land. The similarity of this type of sunken garden to an ordinary cellar is heightened by the fact that the corners are ordinarily quite carefully squared.

Within this carefully excavated area the plants are usually set out so that six will occupy about twenty-five linear feet. Each stands in a platform made by placing two or three loose hoop-like constructions of pandanus leaves one on top of the other and by subsequently filling the interior with humus and sand. The hoops are doughnut-shaped and have maximum dimensions of three feet in over-all width and a coil width of from four to six inches. A loose wrapping of pandanus holds each ring together.

Each platform is separated from its neighbor by a space of several inches. Those on the outside are set a greater distance, eight inches or so, from the vertical wall of the garden. A bobai garden looks like a shallow, carefully excavated pool in which is set a rectangular pattern of evenly spaced, circular platforms rising several inches above the water level, each bearing at its center a single plant.

The British in their control over these islands have met with considerable success in encouraging the people to retain their aboriginal culture. As a result, although the modern Gilbertese subsists to a considerable degree on purchased canned goods, the bobai, grown in time honored fashion, is still the largest starchy constituent of his diet.

ROBIN A. DREWS

U. S. NAVY

NOTES AND NEWS

MEETING IN WEST AFRICA

The Institut Francais d'Afrique Noire at Dakar, French West Africa, announces the first annual meeting of West African ethnologists, geographers, and naturalists to be held at Dakar from the 8th to the 14th of December, 1944. The purpose of this meeting, which is planned to attract participants from all West Africa, is to arrange for an organization to continue annual meetings of those interested in the area and to exchange information on materials and methods in the fields covered.

The sessions will be divided into the following sections:

1. The Physical Environment
2. Botany and Zoology
3. Anthropology, Ethnology, and Linguistics
4. The Problem of the Preservation of National Monuments and Historic Sites
5. Problems of Research Methods

The call has been circulated by Prof. Th. Monod, director of the Institut, and his assistant, Dr. G. J. Duchemin. Because of the difficulties of transport, it is recognized that attendance from outside West Africa is practically impossible, but the directors will be glad to receive papers for presentation at the meeting.

ANNUAL MEETING

In accordance with the Council resolution of December 7, 1943, empowering the Executive Committee to select the date and place for the 1944 annual meeting of the American Anthropological Association, the Committee has voted that the meeting be held in New York City on Saturday, December 16, at 2 P.M., at the Men's Faculty Club, Columbia University, 400 West 117 Street, New York, New York.

A dinner will be held at the Faculty Club, after the business meeting, under the auspices of the American Ethnological Society, to be followed by an evening session on "Anthropology and the War," with a limited number of ten minute talks with free discussion.

Members of the American Ethnological Society will receive notice of the dinner and the evening program. Other people interested should communicate with the Secretary, E. Adamson Hoebel, New York University, Washington Square College, New York, New York.

PITT RIVERS MUSEUM PUBLICATION

The Pitt Rivers Museum at the University of Oxford has inaugurated a new series of "Occasional Papers on Technology" under the editorship of J. K. Penniman and B. M. Blackwood. The first of these, *The Manufacture of a Flint Arrow-head by Quartzite Hammer-Stone* by Sir Francis H. S. Knowles, Bart., is now available and can be purchased from the Museum for five shillings.

Sir Francis Knowles has been experimenting for many years with the techniques of Stone Age people, using the same simple tools which they employed; namely, the quartzite hammer-stone and the antler or bone pressure flaker. His discovery of preparing the narrow striking platform or "turning the edge" is, the editors believe, published here for the first time.

The Museum expects to start another series, "Occasional Papers on Ethnology and Archaeology," when occasion allows.

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